Military Review

The Professional Journal of the United States Army

FEBRUARY 1991

AirLand Battle Future

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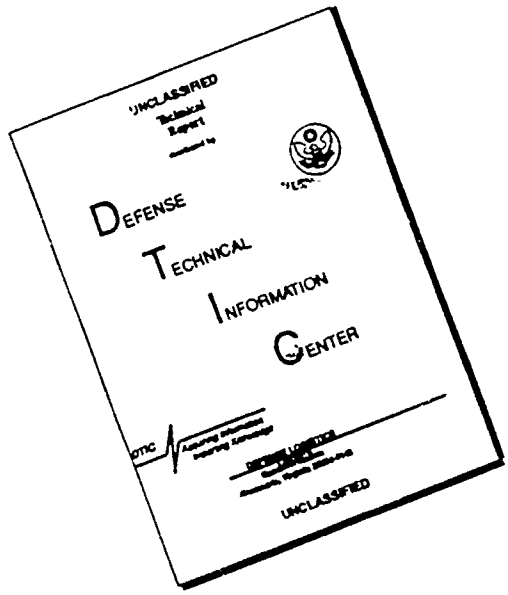

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Professional Bulletin *100–90*, MILITARY REVIEW, appears monthly in English, bimonthly in Spanish and quarterly in Portuguese. Second-class postage paid at Leavenworth, KS 66048–9998, and additional entry offices. This publication presents professional information, but the views expressed herein are those of the authors, not the Department of Defense or its elements. The content does not necessarily reflect the official US Army position and does not change or supersede any information in other official US Army publications. MILITARY REVIEW reserves the right to edit material. Basis of official distribution is one per general officer and one per five field grade officers of the Active Army, and one per headquarters (battalion and higher) of the Army National Guard and the US Army Reserve. MILITARY REVIEW is available on microfilm from University Microfilms, Ann Arbor, MI 48106, and is indexed by the PAIS (Public Affairs Information Service) Bulletin. Postmaster: Send change of address information to MILITARY REVIEW, USACGSC, Fort Leavenworth, KS 66027–6910. Telephone. (913) 684–5642 or AV 552–5642; Subscriptions (913) 684–5130.

MILITARY REVIEW (USPS 122–830)
US ISSN 0026–4148

Military Review

Headquarters Department of the Army
Prepared by
US ARMY COMMAND AND GENERAL STAFF COLLEGE
VOLUME LXXI - FEBRUARY 1991 - NO 2
Professional Bulletin 100–91–2

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We dedicate this issue to the memory of Colonel Dana M. Fishback, Assistant Deputy Commandant of the Command and General Staff College who died on 15 January 1991. Colonel Fishback was chairman of the Military Review Advisory Board and a staunch advocate of this periodical. He was a soldier-statesman who dedicated himself to his family and those around him. In his most recent capacity he provided leadership, support and encouragement to many in Military Review and the entire Command and General Staff College team. He will be very much missed.

The future ain't what it used to be

It has become fashionable to quote Yogi Berra. One of Yogi's most quoted illuminations is the headline attached to this editorial. To bend the quote a little, the future today is not what we thought it would be yesterday. At one time such operations as *Desert Shield* and *Desert Storm* would not have been foreseeable contingencies, especially in the sheer magnitude of forces deployed. It should be clear, however, that in the deployment and mobilization phases and in the combat that is sure to come, these operations hint at future missions for the Army.

This issue of *Military Review* is devoted to a discussion of AirLand Battle Future (ALBF), the concept that is being worked by the US Army Training and Doctrine Command, the Combined Arms Command, proponent branches and many others. ALBF is being designed to thrust the Army into the 21st century and to meet the needs of an army facing a multipolar world order and multidimensional threat,while considering the underlying realities of force and resource reductions.

Originally scheduled for last August, this subject was slipped a few months because of the fluid nature of the work being done to formulate and articulate the ALBF concept. We proceed with this issue with the awareness that the concept of ALBF is still in its adolescence and that more work is still to be done.

This new concept is evolutionary rather than revolutionary and builds upon the successful and well–integrated fundamentals of AirLand Battle doctrine. To open the discussion, Major General Stephen Silvasy Jr. paints a picture of the future tactical battlefield, a nonlinear battlefield of great distances and unprecedented lethality, a place requiring "rapid mental and physical action" of tactical and operational commanders. Silvasy also calls for combat service support organizations and concepts to "change significantly" in order to support warfighting on this future battlefield. His article, "AirLand Battle Future: The Tactical Battlefield," is the first of what we hope will be a continuing discourse as the Army forges its future concept.

Retired Lieutenant General Frederic J. Brown underscores the success of the current doctrine, but adds a note of caution to the euphoria of developing these new ideas. A danger in *not* encouraging open discussion as we develop the Army of the future would be that ALBF results in "an expensive myth politically satisfactory in peacetime but a ticking national time bomb in war."

Brown's article reminds us that military officers are implicitly aware of the concept of "saluting point." Though a commander is ultimately responsible, the best pure solutions are the product of sound staff work based on command guidance—commander's intent—and the synergism achieved by vigorous study and discussion about the issue at hand. The point is reached, however, sometimes sooner, sometimes later, when the commander makes a decision. When the saluting point is reached, the mission must be performed, leaving no room for a minority report by dissenting staff members.

ALBF has not yet reached its saluting point. Many concurrent actions are moving forward, including a new edition of US Army Field Manual 100—5, *Operations*, being created at Fort Leavenworth, Kansas, from a clean sheet of paper. Along with the rest of the world, we will be riveted to news from the gulf, seeking every hint at the combat performance of the Army and the welfare of our comrades–in–arms. This news will tell us much about the future. For now, we invite all readers of *Military Review* to participate in the discussion. The success with which the Army addresses the future may very well depend upon the depth and the breadth of this dialogue. As Yogi would say, "It's not over 'til it's over." As a matter of fact, it may be just beginning.

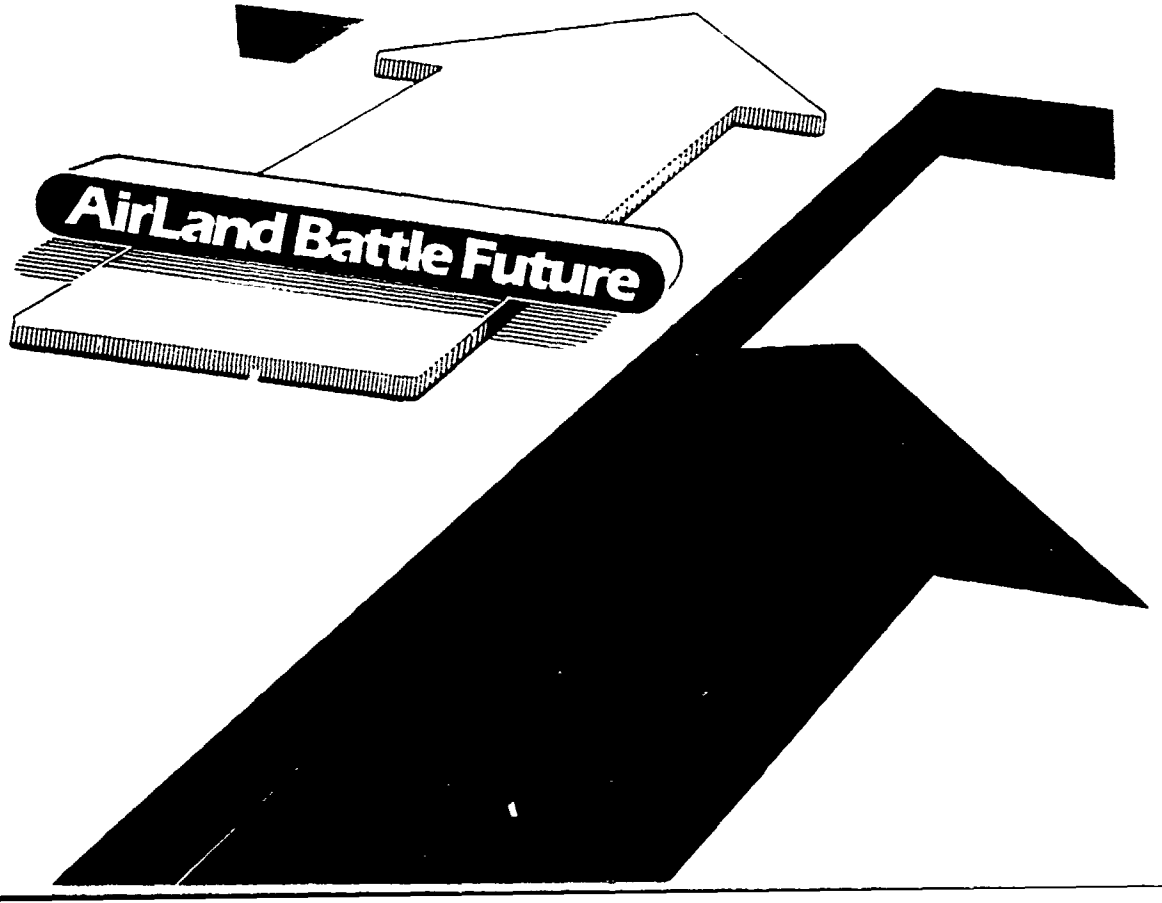
SFR

AirLand Battle Future

The Tactical Battlefield

Major General Stephen Silvasy Jr., US Army

Doctrinal change does not come easily to an army. The debate surrounding AirLand Battle spanned several years and many would say was critical to its development. Major General Silvasy, US Army Training and Doctrine Command's deputy chief of staff for Concepts, Doctrine and Developments, provides a candid look at the direction that the latest evolution of our doctrine, AirLand Battle Future, is taking. Emerging concepts of how best to fight (and especially how to support the fight) on the future, nonlinear tactical battlefield will certainly require many changes in our doctrine, structure and approach to training soldiers and units. Silvasy's article provides an overview of the new doctrine and lays the groundwork for future discussion.



A TOP ARMY priority over the past year has been the Training and Doctrine Command (TRADOC) effort to develop the AirLand Battle Future (ALBF) concept. The TRADOC commander, General John W. Foss, has outlined the emerging concept and the strategic and operational impacts of ALBF on our future Army in several publications. As we continue to refine our work, we have attempted to apply Foss' thoughts to the tactical level of war, focusing at division and below, to describe how our Army might fight on the less dense, less-structured battlefield we are convinced will characterize warfare by 1995 and beyond.

In the years ahead, we can expect the tactical battlefield to change in several important aspects. Increasingly, we will fight on less dense, more open battlefields. Though these less-structured battlefields will be more common at the operational level, they will be evident at the tactical level as well. Because most armies will field fewer forces, due to arms control agreements and the high cost of modern armies, we will often be faced with situations where we must accept large gaps between our forces. To conduct decisive operations, commanders at all levels will have to concentrate their forces, which will entail taking more risks as large areas are left uncovered. At the tactical level, this imperative to mass forces will require rapid mental and physical action.

Besides being more open and fluid, future battlefields will also be much more lethal. Ironically, the growth in lethality relates less to the enhanced capabilities of direct-fire systems than it does to the tremendous advances in the ability of military forces to acquire information about the enemy; to fuse and distribute it on a real-time basis; and to engage high-value targets at great distances with exceptional accuracy. With these capabilities, any force, friend or foe, whether deployed in position for a significant time or on the move, can be detected and attacked well before it gets within direct-fire range.

Surviving and winning on the less dense, more lethal battlefield will require that we develop some new procedures and perfect some old techniques. First, units not involved in combat operations must enhance survivability by remaining dispersed well to the rear of the battle zone and by avoiding release of electrical or thermal signatures. Second, units must not only move frequently, but must also operate effectively on the move. And third, units must be able to move clandestinely and rapidly on multiple routes to mass quickly.

Notwithstanding these significant changes, much on the future battlefield will remain the same. In the final analysis, success will depend on the ability of combined arms teams to work together and on bold, innovative leaders who can make decisions on the move and inspire their soldiers and units to reach their full potential.

Due to arms control agreements and [high costs], we will often be faced with situations where we must accept large gaps between our forces. To conduct decisive operations, commanders at all levels will have to concentrate their forces, which will entail taking more risks as large areas are left uncovered. At the tactical level, this imperative to mass forces will require rapid mental and physical action.

To achieve operational-level objectives—as established in the joint force commander's campaign or major operations plan—we must seek to dominate the enemy at the tactical level. Emphasizing the importance of maneuver, we seek to avoid "head-to-head," attrition warfare. When we do attack, we will hit his flank and rear. At all times, we will focus primarily on his forces and rarely on terrain objectives. Our goal is to gain and maintain the initiative; to stay on the offense, even if our forces are on the defense at the operational level.

During initial stages, while the operational-level commander establishes the conditions for decisive operations, tactical-level commanders disperse their forces to reduce vulnerability by

Mechanics working on the rotor hub of a UH-60 Blackhawk in Saudi Arabia, 15 August 1990.

Units not involved in combat operations must enhance survivability by remaining dispersed well to the rear of the battle zone and by avoiding release of electrical or thermal signatures. . . Units must not only move frequently, but must also operate effectively on the move [and] be able to move clandestinely and rapidly on multiple routes to mass quickly.

hindering enemy acquisition and long-range attack. Units must then mass quickly, gain positional advantage over the enemy and fight short, violent battles to force the decision over the enemy. The better our long-range intelligence and fires, the shorter the final close combat battle. These tactics will allow us to bring overwhelming force to bear to destroy the enemy at the time and place his forces are most vulnerable. Maneuver units will be committed at the decisive stage, maneuvering through gaps to attack the flanks and rear of significantly weakened enemy forces. After defeating the enemy, friendly units will disperse, reconstitute and prepare for the next battle. Units may return to their original dispersal areas or move forward or laterally to other dispersal sites. Some units may be reconstituting while others are engaged, and still others are maneuvering.

Organization of the Battlefield

Based on the joint force commander's intent, the corps commander will be assigned an area similar to that shown in figure 1. Divisions will not initially have assigned sectors along the corps "front," but will operate more as if they had received a reserve mission.

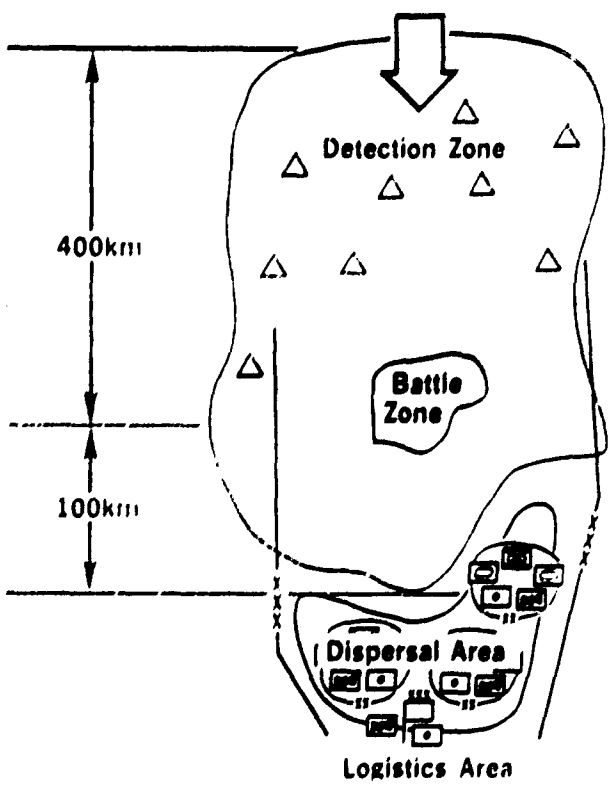


Figure 1. The depth array

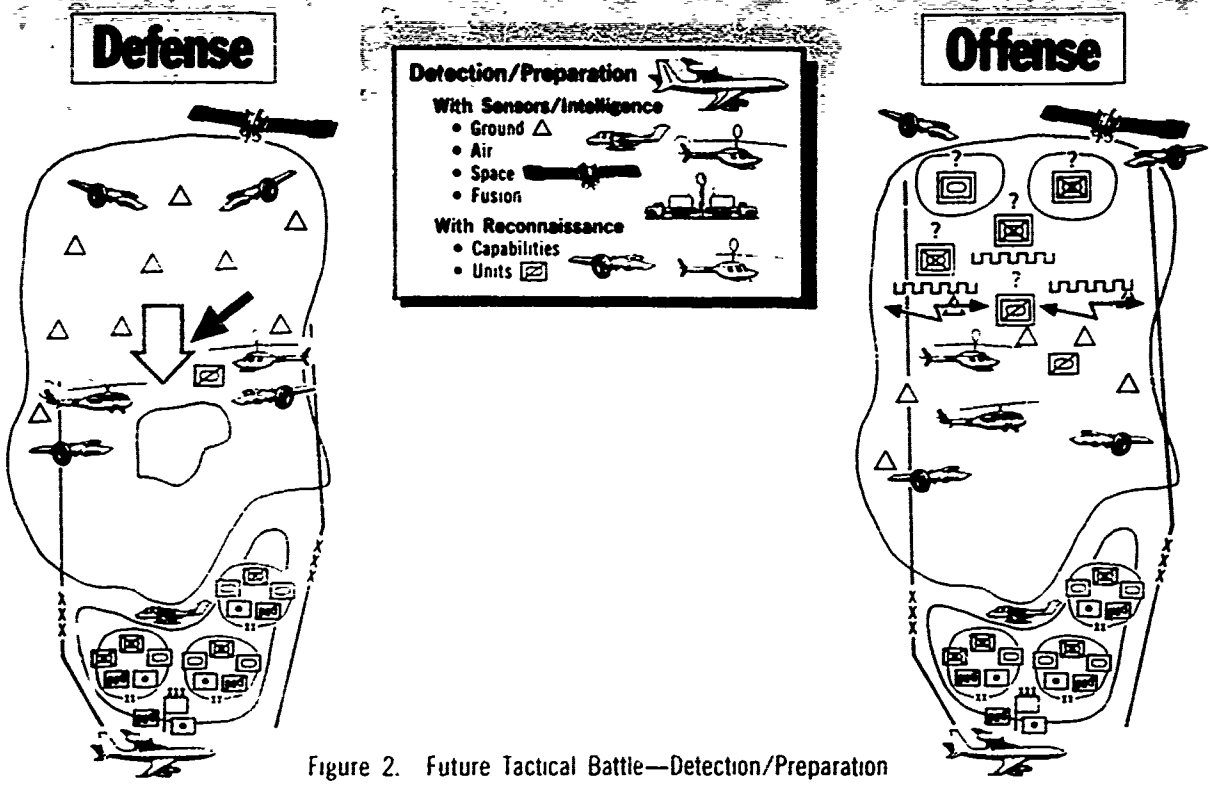


Figure 2. Future Tactical Battle—Detection/Preparation

Divisions, brigades and battalions will move into the dispersal area, spreading out to avoid detection and engagement by enemy long-range fires. Units will remain dispersed, preparing for battle, as the corps commander develops the situation, forms his plan, decides and then "shapes" the enemy with attack helicopters and long-range, surface-to-surface and tactical air-delivered fires. At the appropriate time, divisions will be committed and will maneuver to engage and defeat enemy forces in the battle zone.

Uncommitted combat and combat support forces remain in dispersal areas, preparing for future operations, while supply and maintenance, transportation assets and other support activities operate from the logistics area to deliver timely logistic support to maneuver forces.

We have categorized future operations in four stages:

- Detection-preparation.
- Establishing conditions for decisive operations.
- Decisive operations.
- Reconstitution.

Detection-Preparation. This is actually a continuous process and is primarily the corps commander's responsibility. He will take advantage of strategic and operational-level intelligence systems to collect information on the enemy. As the level of enemy activity develops, he will begin to use all available assets to complete the task of locating and identifying specific enemy forces. Reconnaissance forces, either ground or air, will verify where the enemy is, and just as important, where he is not. In an era of reliance on electronic sensors, the corps and subordinate commanders must provide security for their forces through the increased use of dispersion, but they must also employ a cavalry screen as a hedge against enemy deception operations (fig. 2).

Tactical units have an important, if not crucial, role in this stage. Divisions moving into the corps area will disperse and begin normal planning procedures in preparation for combat. Units must remain dispersed and undetected to ensure their freedom of movement and to deny the enemy information.

During this stage, units will accustom themselves to operating in the new environment, study their enemy and continue to train. Training should focus on the basics and include multi-echelon joint and combined operations; reinforce tactics, techniques and procedures learned at combat training centers; and make use of available simulators and simulations to hone combat skills.

Cavalry and long-range surveillance units (LRSU) will move forward into the detection

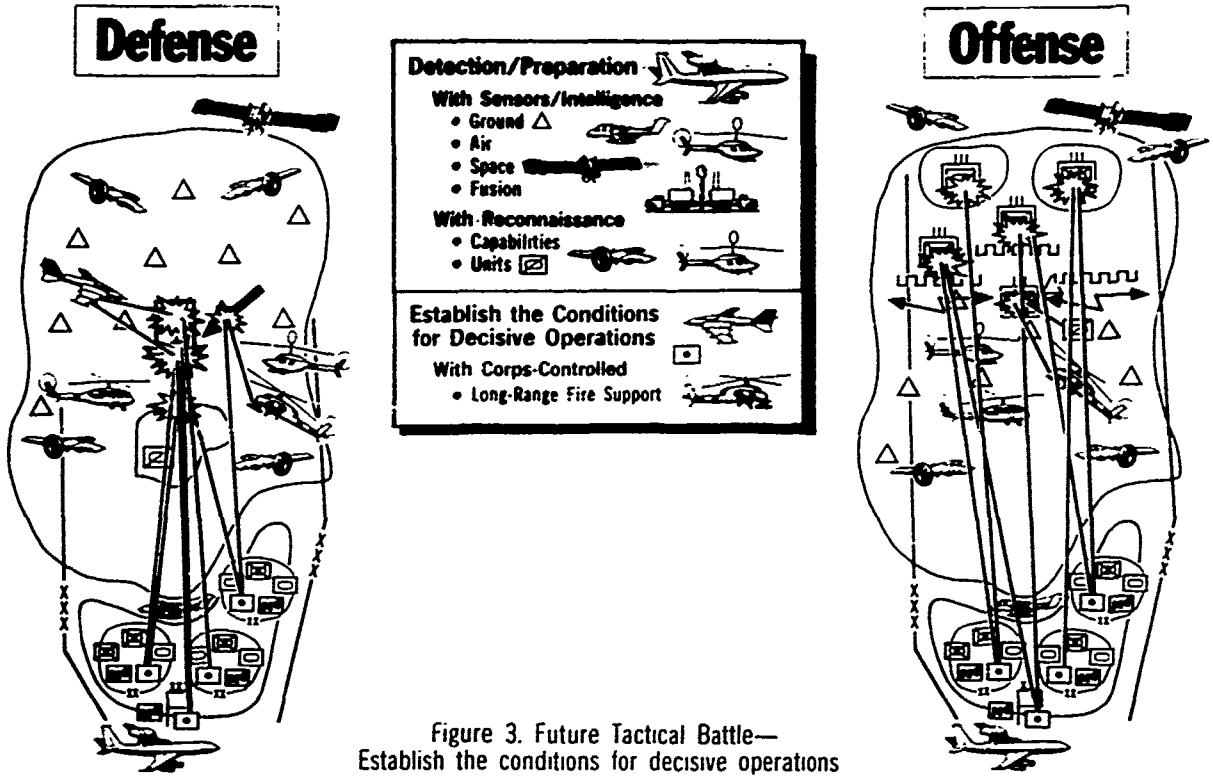


Figure 3. Future Tactical Battle—
Establish the conditions for decisive operations

area, complementing unmanned sensors. Cavalry will provide a degree of security for long-range shooters that may be pushed forward. Units will remain mobile, stopping long enough to resupply.

Logistics planners will use this stage to tailor logistics support to the unit mission. Supplies and equipment requirements will be determined as planners anticipate future needs based on expected engagements and battles.

Toward the end of the detection–preparation period, the corps commander will decide on a course of action designed to gain and maintain the initiative throughout the entire campaign, battle or engagement, whether in defensive or offensive operations.

Emphasizing the importance of maneuver, we seek to avoid "head-to-head," attrition warfare. When we do attack, we will hit his flank and rear. At all times, we will focus primarily on his forces and rarely on terrain objectives. Our goal is to gain and maintain the initiative; to stay on the offense, even if our forces are on the defense at the operational level.

Establishing Conditions for Decisive Operations. Having decided on a course of action, the corps commander then sets out to establish the conditions necessary for decisive operations. He will use tactical air, the Army tactical missile system (ATACMS) and other long-range artillery systems and attack helicopters to shape the battlefield as he envisions the battle progressing and to separate enemy forces in space and time for the approaching decisive battle. He will control long-range fires to weaken the enemy force and to allow our forces to break through (in an offensive) or to force a decision (in an operational defense). He will employ deception operations in an attempt to confuse enemy intelligence collection assets as to the time and place of our attack or maneuver. Varying the tempo and denying the enemy his goals will allow the corps commander to grab and hold the initiative throughout this phase, until the proper conditions and timing are present for the next phase (fig. 3).

At the tactical level, units at division and below will receive orders and conduct mission planning, orienting on the commander's intent and their missions. As orders are issued through the chain of command, brigades and battalions will continue to plan and prepare, while companies conduct normal troop-leading proce-

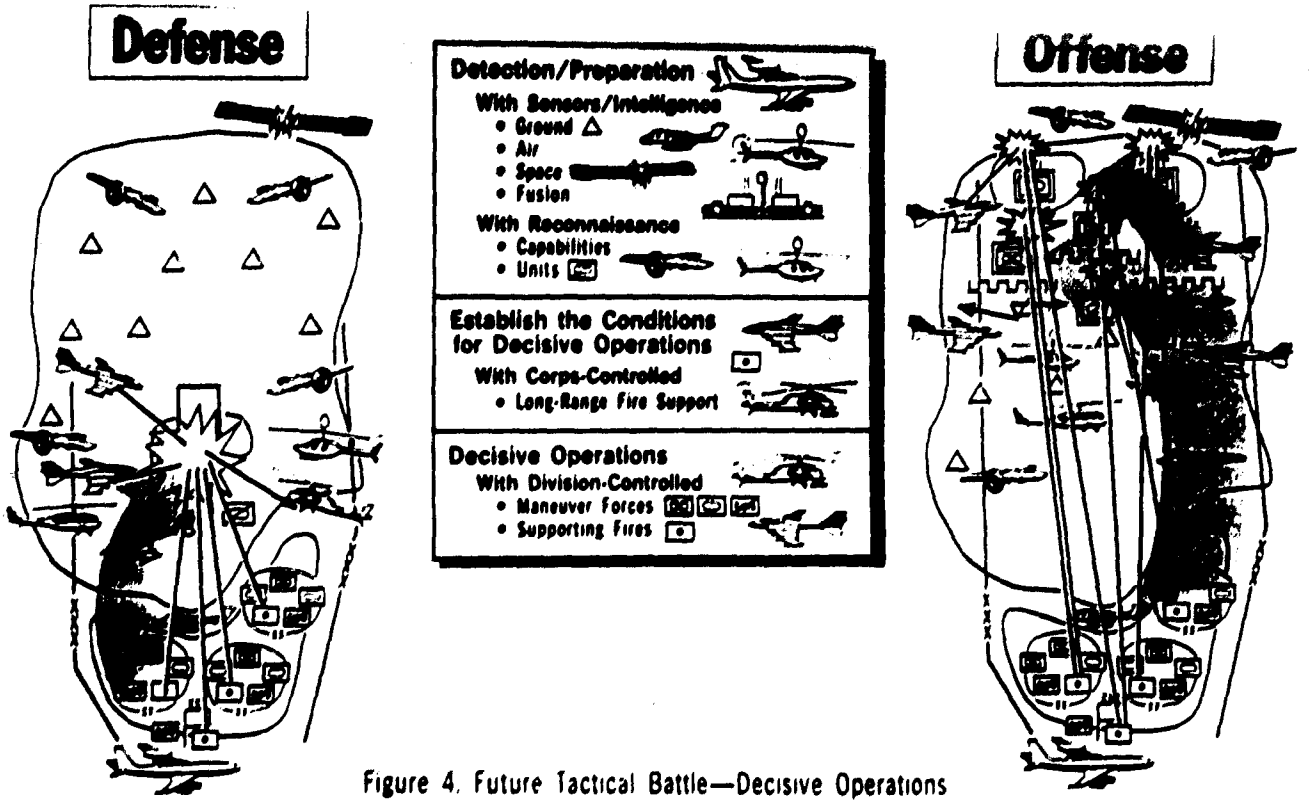


Figure 4. Future Tactical Battle—Decisive Operations

dures, preparing weapons systems and soldiers for combat. If possible, rehearsals will be conducted and routes cautiously checked so as not to reveal operations.

Cavalry units and LRSUs will continue reconnaissance and surveillance of battle and detection zones. Cavalry, both ground and air, will help in shaping the battlefield, assisting tactical units as they move into position and denying information to enemy reconnaissance elements. Engineer units and other selected combat support units will play a key role in shaping the battlefield. Movement for maneuver purposes may have to start prior to all the proper conditions being set. The division commander must take all possible measures to avoid meeting engagements and to prevent the enemy from taking up hasty defensive positions.

Cavalry and long-range surveillance units will move forward into the detection area, complementing unmanned sensors. Cavalry will provide a degree of security for long-range shooters that may be pushed forward. Units will remain mobile, stopping long enough to resupply.

In order to avoid stepping into the "wrong" situation, the division commander will use air cavalry and division unmanned aerial vehicles (UAVs) to supplement corps intelligence coverage. Obviously, commanding and controlling on the move is much different (and more difficult) than our current view of controlling the close battle from a tactical command post (CP) and planning our next battle at the main CP. How to best do all of that should be the subject of much debate and discussion during the next few years.

Decisive Operations. Here is where our old ideas of specific terrain objectives and limited missions will have to give way to operating more in light of the commander's intent and being able to take advantage of situations that arise on the battlefield. This means giving subordinate commanders more authority to operate within the larger picture and, if necessary, to take more risks.

Maneuver is the necessary ingredient for decisive operations. Tactical units, supported by massed tactical air, corps artillery and attack helicopters, will maneuver to gain positional advantage and complete the destruction of the enemy force. In the offense, this maneuver might be the breakthrough after finding or creating a gap. In the defense, it is perhaps a spoiling attack type of maneuver over a greatly weakened

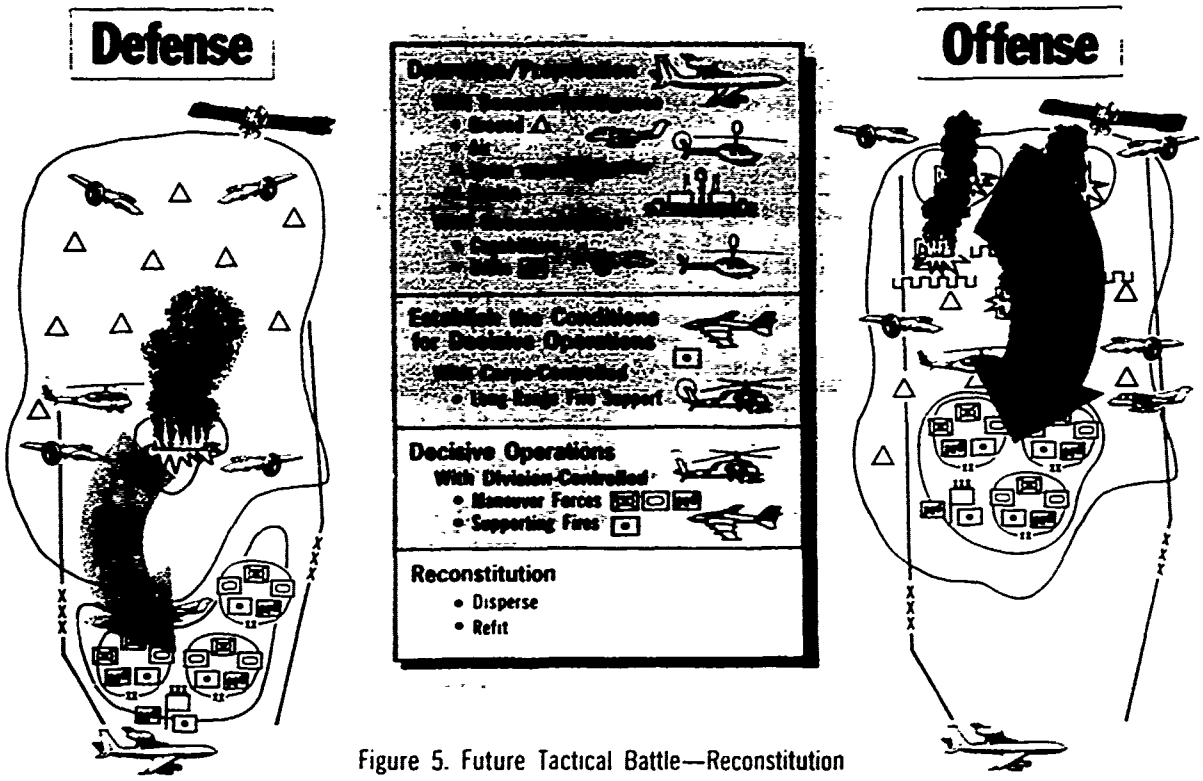


Figure 5. Future Tactical Battle—Reconstitution

enemy. Tactical maneuver will differ significantly in both distance (farther) and speed (faster) from the way battalions and brigades conduct offensive operations today (fig. 4).

Divisions will be responsible for conducting this close maneuver battle. The scheme of maneuver and tasks assigned to subordinate combined arms brigade formations should be designed to place the enemy force at a major disadvantage and, if total destruction is necessary, to bring the close battle to a quick and successful finish.

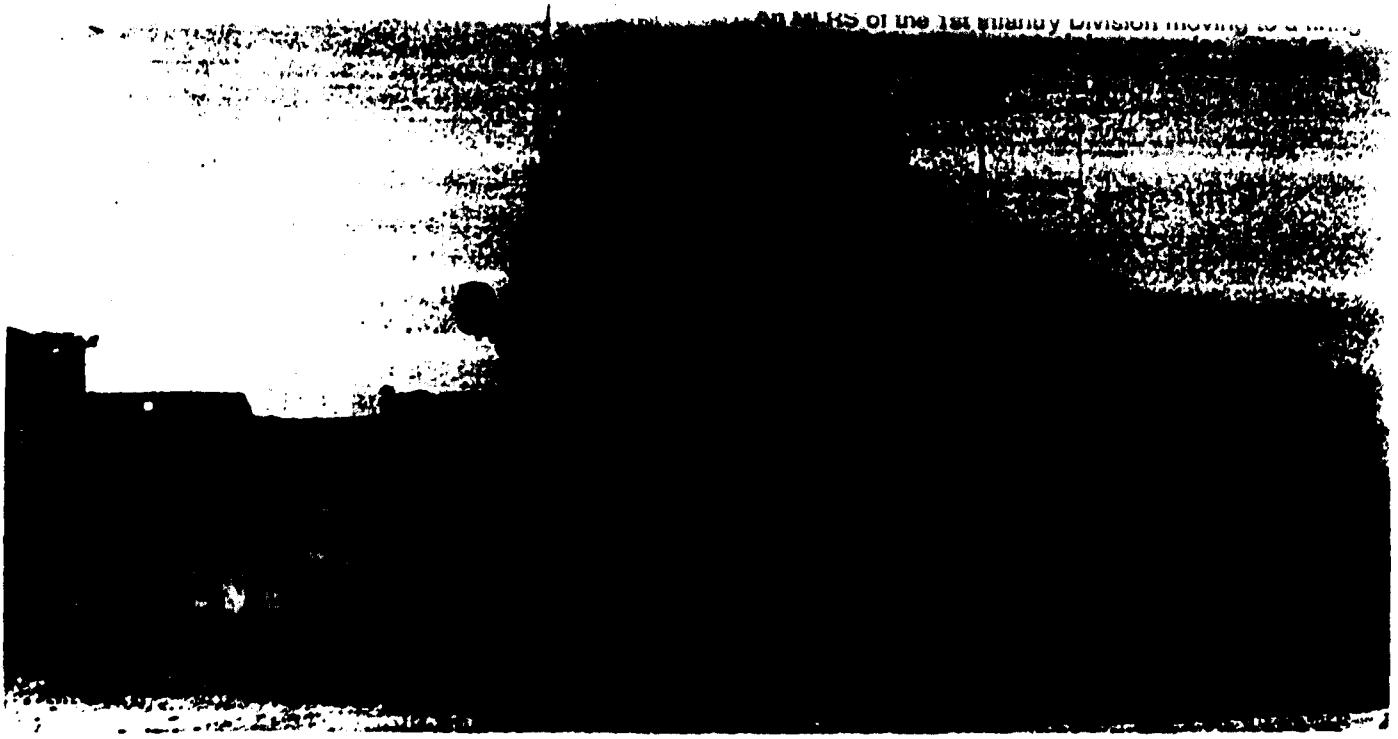
Combined arms brigade formations will be a team, accustomed to working together and able to organize quickly for the mission at hand and to change as the situation dictates.

Maneuver is the necessary ingredient for decisive operations. Tactical units, supported by massed tactical air, corps artillery and attack helicopters, will maneuver to gain positional advantage and complete the destruction of the enemy force. . . Maneuver will differ significantly in both distance and speed from the way battalions and brigades conduct offensive operations today.

Battalions have a simple task. They kill and destroy the enemy in close combat. Units will move quickly along multiple axes, concentrate rapidly at the appointed place and time and strike the enemy. Commanders will need the intelligence and control mechanisms to operate in a rapidly developing situation. The battalion commander will earn his pay by moving his force quickly, being able to attack from the move and generating combat power much faster than the enemy. Cautious battalion commanders may feel ill-at-ease in such an environment; risk taking by thoughtful professionals will be the rule.

Cavalry units will guide the deploying combat units to the enemy flanks or rear and then provide security for the force. Maneuver units will go forward with a full level of supplies. If the move is extended, the commander may have to ensure refueling is accomplished prior to the final maneuver. This will only happen if he plans ahead.

During the battle, combat service support (CSS) units focus on battlefield recovery and repair. They must also deliver ammunition and fuel forward. A constant ebb and flow of organic battalion combat support vehicles between units and supply points does not make much sense over these distances and under these conditions. Supplies must be pushed forward by higher headquarters.



The corps commander. . . sets out to establish the conditions necessary for decisive operations. He will use tactical air, the Army tactical missile system and other long–range artillery systems and attack helicopters to shape the battlefield as he envisions the battle progressing and to separate enemy forces. . . He will control long–range fires to weaken the enemy force and to allow our forces to break through or to force a decision.

Operations on these less dense, more open battlefields will require initiative and flexibility from our soldiers and especially our leaders. A more mobile orientation, combined with the sophistication of long–range, accurate weapons fire, will greatly increase the difficulty of synchronizing functions and harmonizing combat power. In fact, synchronization and harmonization will mean different things at different levels.

Reconstitution. Following the decisive battle, tactical maneuver units will immediately reestablish security of the force and will disperse and prepare for further operations. The corps commander will designate whether reconstitution takes place forward, laterally or to the rear. CSS units will deliver fuel, ammunition and other supplies to the unit. Battlefield maintenance will focus on repair of recovered vehicles and return disabled vehicles to the rear for more detailed repair. Obviously, logistic commanders must be in tune with the current battle, as well as planning for the next operation (fig. 5).

Cavalry and other reconnaissance units will continue their detection missions and provide security as maneuver forces resupply and prepare for the next operation.

Operations on these less dense, more open battlefields will require initiative and flexibility from our soldiers and especially our leaders. A more mobile orientation, combined with the sophistication of long–range, accurate weapons fire, will greatly increase the difficulty of synchronizing functions and harmonizing combat power. In fact, synchronization and harmonization will mean different things at different levels. Despite this added dimension, risks are more than offset by greater potential rewards in terms of a quicker conflict resolution with fewer friendly casualties. The alternative is to allow the enemy to gain the initiative and to hope that we can take it back sometime before the enemy achieves his operational objectives.

Emerging CSS Concept

As we look at operations on a more open, less–structured battlefield, it is obvious that our current logistics concepts are out of tune and must change significantly. Emerging CSS concepts consider unweighting significant logistics capabilities from some maneuver units so they can develop the quickness and agility they need and can concentrate on fighting. Divisions and battalions will retain relatively little of their current CSS responsibilities. Battalions will have limited emergency resupply, redistribution and recovery responsibilities. Division will be the integrator between brigade forward support battalions (FSBs) and corps support groups. Logistics are focused at corps and in FSBs at each combined arms brigade formation.

The FSB and corps support command (COSCOM) commanders must follow the battle in real time and predict major requirements. Expansion of the existing command and control system and modern communications will bring logistics operations centers more fully into the current battle. While needs can be anticipated and supplies and services pushed forward, resupply will be at the time and place the supported unit requests. The logisticians' key role will be to sustain combat power.

Corps will be the linchpin for providing CSS. Tailorable, multifunctional support groups will provide support directly to the forward support battalions and will also support uncommitted maneuver and corps support units.

At division level, the division support command will coordinate the actions of forward support battallions and corps support groups from the COSCOM to synchronize and integrate their support. Some currently available division sustainment responsibilities will move to corps, but the COSCOM commander will be able to anticipate needs and provide logistics support directly to FSBs.

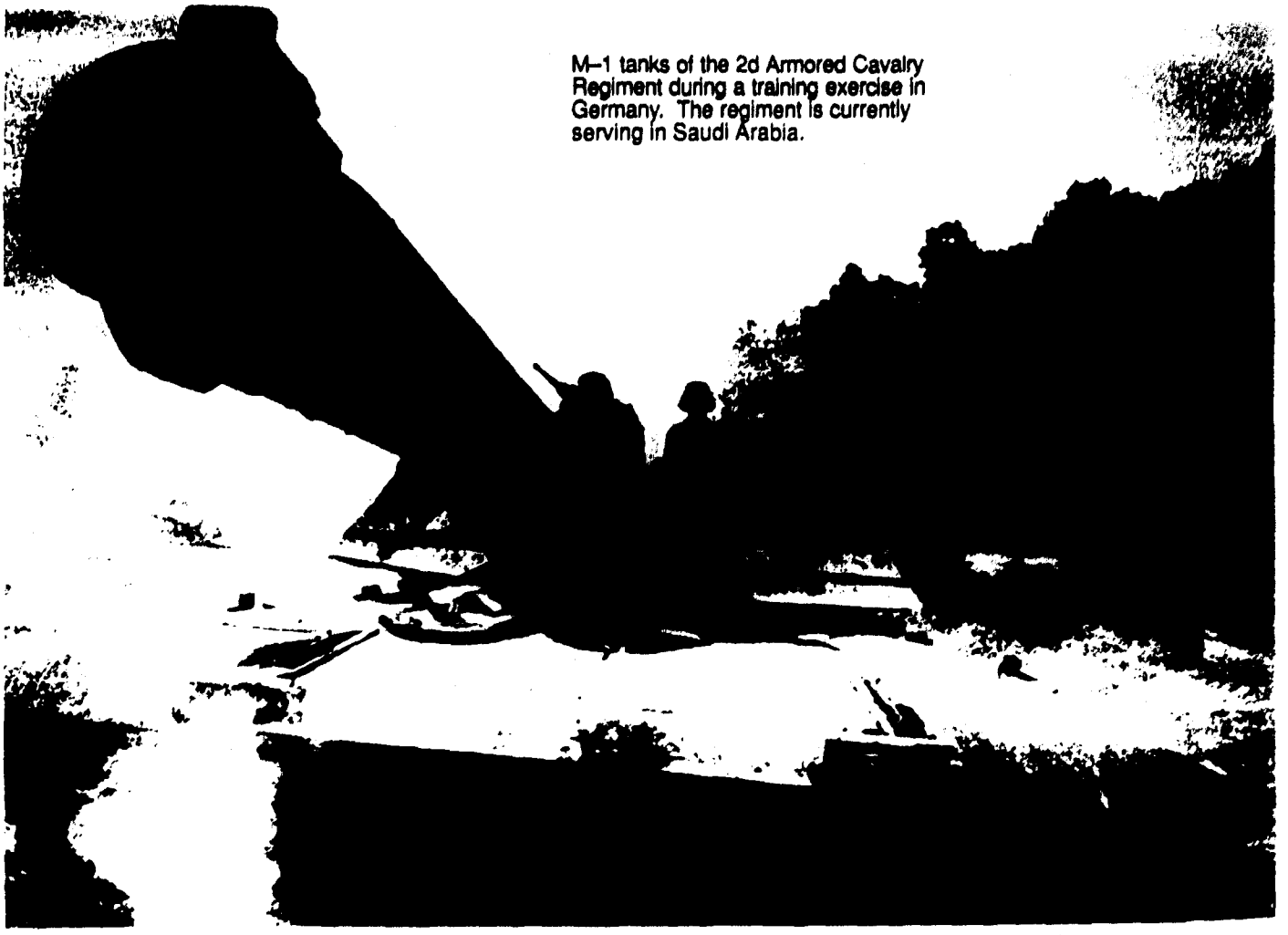
Each combined arms brigade formation will have an FSB with enhanced capabilities. Resupply will be by unit distribution (supporting units delivering supplies and services to supported units) down to weapons systems. Battalion and company commanders will be responsible only for operator/crew maintenance. The FSB commander will be responsible for providing unit and direct support maintenance for the combined arms brigade formation. Using integrated maintenance assets, the FSB will be able to send forward contact teams with both unit– and direct support–level expertise. Class IX repair parts will be restructured with greater mobility and fewer storage locations and will work from the authorized stockage list (ASL) for better coverage of needed parts. Battalion commanders will retain a small recovery capability and some personnel, medical, feeding, ammunition and fuel redistribution assets.

As we think about the future and warfare on a less–structured battlefield, it becomes clear that an overarching requirement for logistics commanders is to enter the real–time command and control arena. The logistics commander must see and read the battle in time to anticipate support requirements and to get the necessary supplies to where they are needed today, while also preparing for tomorrow's operations. A modern command and control system will give the logistics commander the critical information needed to support the maneuver commander's intent.

Organizational Changes

Certainly, we like our current organizations and our ways of doing business today. They have served us well, especially as we viewed the more linear close battle envisioned in Central Europe. But if we are to adapt our organizations to the future, we need to look at ways to apply newer concepts. One way is to have a "clear alternative" organization for testing, to be compared to our current organizations. Such a test organization must be sufficiently different to determine if we can achieve what we set out to do or whether other modifications are required.

The more open battlefield places a premium on mobility, agility, flexibility and rapid generation of combat power. These concepts lead toward unweighting some echelons of logistic



M–1 tanks of the 2d Armored Cavalry Regiment during a training exercise in Germany. The regiment is currently serving in Saudi Arabia.

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responsibilites so their organizations can move more quickly, with logistics functions concentrated at corps and brigade. To enhance mobility and agility, a move to smaller maneuver battalions and combined arms brigades (rather than task organizing from division for each operation) appears to merit further testing. Allowing the corps commander to concentrate his long–range firepower indicates that we should look at assigning these assets to the corps, with the idea that they can always be mission–assigned to the divisions for a linear fight.

Certainly, concepts must drive any structure changes and on–the–ground testing will be necessary to demonstrate that improvements are actually achieved.

Revising Doctrine and Training

In the immediate future, some of these changes will be reflected in key doctrinal publications, especially in US Army Field Manual (FM) 100—5, *Operations*, the Army's capstone operations manual and later to other manuals (such as FM 100—15, *Corps Operations*, and FM 71–100, *Armored and Mechanized Division and Brigade Operations*). Revision of FM 100—5 is presently underway at the Command and General Staff College at Fort Leavenworth, Kansas. The current edition of the manual, though still highly useful and relevant, must be revised to address additional aspects of more open battlefields and to place new emphasis on the Army's mission of projecting land power to distant theaters

and fighting as part of joint and combined forces. With the revision of FM 100—5 underway, we must now turn to updating our principal tactical–level manuals. Corps and division will operate differently, and our doctrine must reflect those changes. The key task will be to retain what is of great value now and to integrate more open thinking into our work.

Training must include the basics of both linear and nonlinear (maneuver) warfare on a less–structured, more open battlefield. Leaders must see the battlefield and focus combat power to win, understanding the difference between a risk and a gamble. It will be more important that subordinate leaders understand the commander's intent and receive mission orders. We must foster initiative in our leaders so that they will be able to handle the unpredictability of future battlefields.

It is important to realize that AirLand Battle Future represents an evolution, not a revolution in our military thinking. This is especially true at the tactical level where units, when committed, will be expected to fight and win, using tactics consistent with current AirLand Battle doctrine, but in a more mobile setting.

The future battlefield will be less dense, less structured, with greater opportunities and risks, and maneuver warfare will offer the greatest opportunity for success. Although there are, undoubtedly, circumstances where we would have to fight a linear battle, tactical units, trained, organized and equipped for nonlinear combat, can transition to fight on a linear battlefield more easily than a force trained for linear combat can transition to fight on the highly mobile, nonlinear battlefield.

Finally, those who capitalize on technology will have a significant advantage over potential adversaries. We anticipated the impact of technology on the battlefield long before the tumultuous events of the past year or so; we must now continue to capitalize on the advantages we have in this area and continue to modernize those systems that will significantly enhance the capabilities of our tactical units.

Emerging CSS concepts consider unweighting significant logistics capabilities from some maneuver units so they can develop the quickness and agility they need and can concentrate on fighting. Divisions and battalions will retain relatively little of their current CSS responsibilities. Battalions will have limited emergency resupply, redistribution and recovery responsibilities. Division will be the integrator between brigade forward support battalions and corps support groups.

This is our emerging view of the future battlefield and how we expect to fight and win on it. We are still refining these views. Little is set in concrete. If this article stimulates some thought and discussion, it will have served its purpose. The US Army cannot afford to transition to the 21st century by simply downsizing forces or revising concepts that served us well in the 1970s and 1980s! The future is bright for those who think creatively and properly prepare for it. The future battlefield will be open to all branches and to all fighters. Our younger leaders and warriors will recognize change and will accept the challenges facing the Army of the 1990s and beyond. ***MR***

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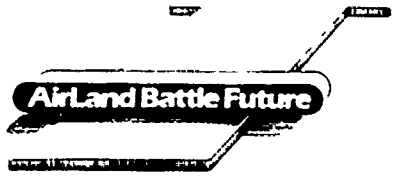
AirLand Battle Future

The Other Side of the Coin

Lieutenant General Frederic J. Brown, US Army, Retired

The discussions of emerging AirLand Battle Future (ALBF) concepts so far have generally focused on the ways and means of development, procurement of the essential equipment and resources and the direction that implementation efforts ought to take. The author tackles what appear to be even more basic questions regarding the emerging doctrine's compatability with known and expected missions, as well as the strengths and limitations that will be present in our Active and especially our Reserve Component forces. He offers several logical assumptions as a basis for his suggestion that perhaps ALBF, as currently envisioned, may be beyond the capabilities of our Total Force of the future. He concludes that we should adjust the pace at which we attempt to change our doctrine to accommodate the realities of the post-Cold War international and domestic situations.



AS BEFITS a great, vibrant organization during a period of accelerating change, the US Army is moving its doctrinal base from AirLand Battle (ALB) to AirLand Battle Future (ALBF). This is tough to do; AirLand Battle was complex and, therefore, long in coming. It hardly seems fair to be changing it again, when so much else is going on. Also, there is much more to changing doctrine than the revision of manuals. It causes cascading change in virtually every aspect of the Army because, as described recently by the chief of staff, doctrine is "the basic rationale for designing forces, determining materiel needs, conducting training and developing leaders."[1] The purpose of this article is to lay out some issues worthy of informed professional discussion as the Army contemplates ALBF.

First and foremost, we are moving from a position of great practical and psychological strength. AirLand Battle doctrine has been enormously successful—a very competitive doctrine against the Soviet Union. The more the Soviets built, the more vulnerable their doctrine of Theater Strategic Operations became. As a result, decades of major Soviet military investment were rendered invalid, with spillover impacts into the larger areas of the Soviet economy and political stability.

Success in Panama may appear assured . . . but it certainly did not seem so in advance. There were extraordinary risks of extended costly urban combat with irregular forces. The shock action of ALB execution was sufficient to virtually paralyze the opponent. The professionalism of the contingency force was such that the initiative, once seized, was sustained.

Our national strategy of competitive advantage was successfully applied to land power even before the materiel essential for execution—JSTARS (joint surveillance and target attack radar systems), MLRS (multiple launch rocket systems) and MSE (mobile subscriber equipment)—had been fully fielded because the strategy and associated doctrine were absolutely credible. The Concept Based Requirements System (CBRS) had ensured that the organizations, equipment and training were consistent, supportive, in place or coming, and that the doctrine had been accepted by the NATO coalition in the form of its FOFA (follow-on forces attack) concept. This success is a direct credit to the Training and Doctrine Command (TRADOC), perhaps the most significant single Army command contributing to the Cold War victory.[2]

The success of ALB doctrine against the Soviet threat appears to have been repeated as demonstrated by the doctrine's successful application in recent contingency operations.

Just Cause was extremely successful as virtually a "text book" case study in ALB execution. The contingency operation was executed as expressed in US Army Field Manual (FM) 100—15, *Corps Operations*, which describes the projection of Continental United States (CONUS)—based forces into an operational theater with "rapid response, quick deployment, and fast, decisive, offensive operations for a clear victory." Success in Panama may appear assured in retrospect, but it certainly did not seem so in advance. There were extraordinary risks of extended costly urban combat with irregular forces. The shock action of ALB execution was sufficient to virtually paralyze the opponent. The professionalism of the contingency force was such that the initiative, once seized, was sustained.

Today, ALB doctrine appears absolutely applicable to Southwest Asia and is, in fact, what the president envisages in describing the *Desert Shield* theater campaign at the strategic level: "If there must be war, we will not permit our troops to have their hands tied behind their backs . . . If one American soldier has to go into battle, that soldier will have enough force behind him to win and then get out as soon as possible . . . I will never, ever agree to a halfway effort."[3] This was rein-

A US soldier looks cautiously down a street in Panama City during Operation *Just Cause*, Christmas Eve 1989.

Although* Just Cause *was conducted in a limited [illegible] against a limited enemy, there was considerable potential for irregular fighting in urban areas. It was a simultaneous nonlinear battlefield, drawing together the requirements for tactical through strategic acquisition and joint "long-range fires" missions.

forced in detail in subsequent Senate Armed Services Committee Hearings where both the secretary of defense and the chairman of the Joint Chiefs of Staff (CJCS) described ALB now in a mid-intensity context.

ALBF is the logical extension of ALB, envisioning what can be possible in the latter half of this decade. The doctrine will use to advantage the quality of our equipment and the competence of our professional force to create a nonlinear battlefield, where our commanders both know combatant locations and can engage to the full 500-kilometer projected depth of the battlefield—technology and resources permitting. Furthermore, the concept is being honed by the full intensity of the intellectual capacity of the TRADOC "family" of proponents and schools as focused by the CBRS. Assimilation of the implications of nonlinearity will be challenging, but no more so than was addressing the blitzkrieg as mobility technology matured in the 1930s, or the transition to deep, close and rear battle at the tactical and operational echelons that occurred in the 1970s and 1980s. The performance and potential of the professional Army today augur well for future fielding of ALBF.

Viewed conceptually, ALBF appears to be even better than ALB:

- It advantages a highly professional army.
- It is a logical extension and, in fact, an improvement of ALB.
- It exercises US comparative advantages in innovative soldiers and new equipment (particularly processors).
- Its cycle of disperse, mass, fight, redisperse and reconstitute appears to reduce the risk of the grinding attrition battle clearly unacceptable to the American people.

In sum, ALBF seems to be a world class doctrine for our professional volunteer land force. It will probably provide a fully integrated national land power capability comparable to our

national preeminance in sea power and air power as the doctrine matures in coordination with materiel, personnel and training.

In fact, ALBF potential has been demonstrated in *Just Cause* and *Desert Shield*. Despite fundamental differences between the two contingency operations, the conceptual underpinnings of the emerging doctrine of ALBF appear to apply to these diverse situations (although there are now new challenges appearing in *Desert Shield*, largely associated with the size of the force required to threaten offensive operations). Although *Just Cause* was conducted in a limited area against a limited enemy, there was considerable potential for irregular fighting in urban areas. It was a simultaneous nonlinear battlefield, drawing together the requirements for tactical through strategic acquisition and joint "long-range fires" missions.

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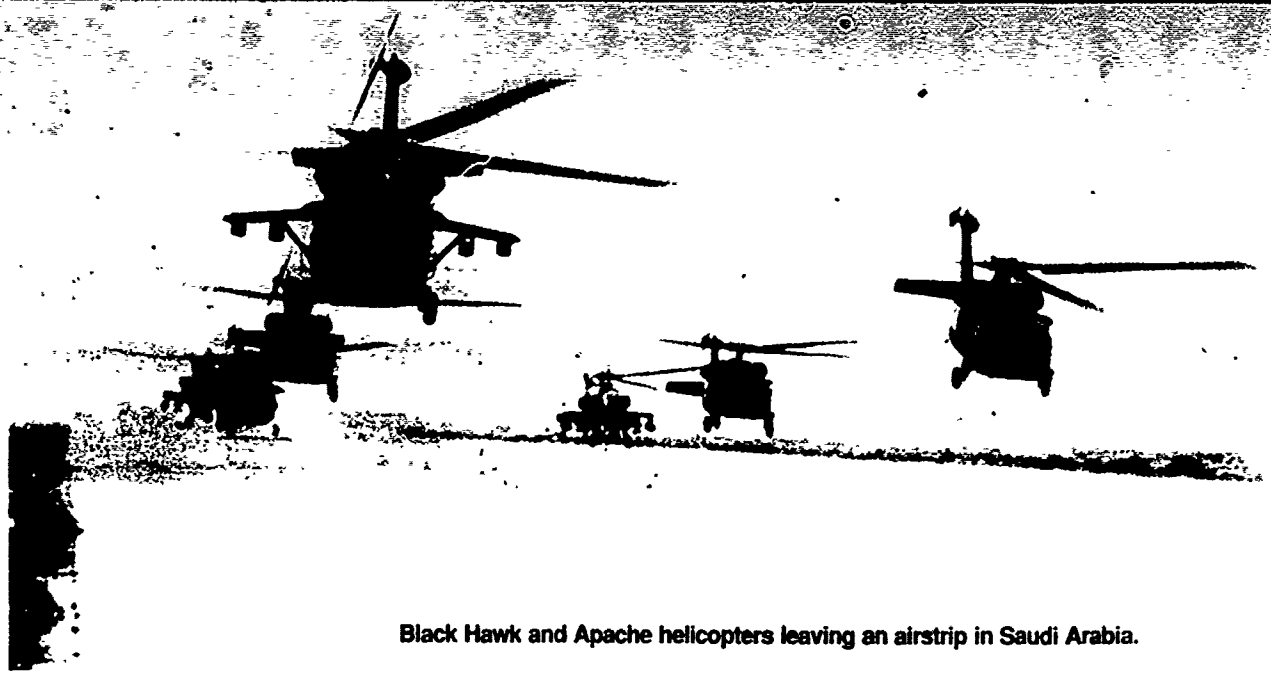
Now *Desert Shield* faces a more formidable regional threat. Iraq is the world's sixth largest army with heavy forces and is one of the larger of the 30 states that possess more than 1,000 tanks. Compounding this challenge have been significant changes in force requirements midway in the deployment due to: changes in missions from deterrence to defense to offensive capability; Iraqi reinforcements into the Kuwait area; and the president's desire to have the capability to achieve decisive results "quickly."

In order to give substance to the president's mission, consideration of *Desert Shield*'s METT-T (mission, enemy, terrain, troops, and time available), now mandates a joint theater force capability to ensure credible capability to execute ALB doctrine (or the "Doctrine of Invincible Force" as ALB is being characterized by President George Bush, Secretary Richard B. Cheney and General Colin L. Powell). In reality, this is "pure" current doctrine straight out of FM 100—15 and previews the potential capabilities and requirements of ALBF. Consequently, US force requirements have gone from 50,000 to 200,000 to 400,000 in weeks. The result has been additional Active Component (AC) combat unit and general logistic requirements that have stressed our current Total Force capability. The ALBF analogue gains credence whether there is actual ground combat or not.

We now have in *Just Cause* and *Desert Shield*—whatever the outcome—a solid "base case" for thinking about ALBF. There is a clear need to consider the national resources required for execution of ALBF under comparable circumstances. The *Just Cause* level seems clearly achievable with contingency forces, but what about another *Desert Shield* in the future? How big a force of what composition will be reasonably available to execute ALBF in similar operations in the future?

That answer depends on how land power and tactical air power and their doctrine, ALBF, fit into our national military strategy. We should consider missions anticipated for land power under strategies based on national military policies of "deterrence readiness" to some agreed upon level of capability and of "mobilization readiness" to fight at higher levels. Deterrence readiness describes our posture since World War II, essentially ready to fight globally in weeks or days, primarily with forward-deployed Regular forces backed up by Reserve forces. Mobilization readiness describes a small, immediately ready contingency capability available in hours or days, but with the preponderance of the force in the Reserves available in months or possibly in years.



Black Hawk and Apache helicopters leaving an airstrip in Saudi Arabia.

[A] Desert Shield–level joint theater force . . . would appear to be an unsustainable level of deterrent capability in the future. It is very difficult to support today with an Army of more than 700,000 and would appear virtually impossible with substantially smaller land forces as planned currently by both executive and legislative branches.

The substantial AC force requirement for the Desert Shield mission is caused by the apparent unwillingness of the Regular force to rely on either our RC forces or allies when the stakes are so high. Perhaps there is a message there about the feasibility of a current doctrine so demanding in execution that neither allies nor Reserves appear sufficiently competent to execute credibly.

Deterrent Force

As developed in the post–Cold War, pre–*Desert Shield* debate, an upper limit for a deterrence capability—the AC contribution—has been seen as either a division or a corps. A division could be the total land force in a small contingency joint task force projected rapidly from the United States. It could also provide forced entry, airborne or air assault, for the Marines or a heavy division to give more punch to a Marine expeditionary force. A division could also be the initial deterrent "trip–wire" backed by air and sea power, then becoming a defensive or offensive force as a full contingency corps deploys. Overall AC force size, Army and Marine, would be determined by the number of multiple simultaneous contingencies the United States plans to be able to address in support of the various theater commanders in chief (CINCs).

A next, much higher level for deterrence could be a *Desert Shield*–level joint theater force. This would appear to be an unsustainable level of deterrent capability in the future. It is very difficult to support today with an Army of more than 700,000 and would appear virtually impossible with substantially smaller land forces as planned currently by both executive and legislative branches. This reduction appears inevitable in the absence of a credible superpower threat that would justify maintenence of a land force at current levels. Irrespective of its clear, critical importance as a measure for US credibility and the rule of law in the post–Cold War era, *Desert Shield* may be an anomaly in portraying future US land power capability.

In fact, one could argue that we are exceedingly fortunate that Saddam Hussein acted in 1990–1991. Earlier, we could not have generated the force due to the continuing threat of the Soviet Union, particularly in Europe. Later, we would not have had the AC combat capability to execute a contingency of this size without a

massive call-up of Reserve Component (RC) combat units and perhaps a draft. We would certainly have been dependent on a much larger ground force commitment from our allies.

However, there may be another message in *Desert Shield* with disturbing implications for our doctrinal development. Some could argue that the substantial AC force requirement for the *Desert Shield* mission is caused by the apparent unwillingness of the Regular force to rely on either our RC forces or allies when the stakes are so high. Perhaps there is a message there about the feasibility of a current doctrine so demanding in execution that neither allies nor Reserves appear sufficiently competent (in equipment capabilities or training) to execute credibly when "the chips are down."

As we are no longer the dominant world political, military and economic power, allies are even more important for mobilization–based force capability than they were for our deterrence–based capability. In fact, proacative involvement with our allies is the* sine qua non *for regional collective security.

In any case, whatever the postulated upper limit of joint AC capability, above that level, the force capability is dependent on mobilizaton—RC or draftee—augmentation and will need to be executable by allies, particularly if US domestic considerations preclude a draft.

Another emerging reality from *Desert Shield* is that the American public expects "partners," if there are to be losses. "Holding our coat" while we fight, will not do. This is particularly true when our principal partners—Europe and Japan—are clear economic beneficiaries of our risk and success in *Desert Shield*, are consuming much less of their national product on defense and are seriously competing with us economically. Economic factors increase in relative national importance as we all convert to the information economy. Furthermore, allies are a clear prerequisite to any regional collective security, both to share the burden of fighting and to establish a satisfactory regional security arrangement after the contingency is over. So we need them and they need us.

Therefore, a key doctrinal development question for the future is to determine what modifications to current ALB doctrine, and the coming ALBF doctrine, are necessary to make it both desirable and feasible for our Reserves and allies to execute with confidence. The doctrine must elicit both the confidence of these forces and that of the professional military that counsels the president. Without this, we simply do not have a credible doctrine.

Mobilization Force

Assuming a threat to the nation sufficient to call up the Reserves (or we will not make a substantial intervention overseas), the mobilization force consists of RC units formed and trained both before and after mobilization. Either cadre or fully constituted units are maintained at a sufficient state of readiness (variable readiness) such that they would be combat ready as required in the various contingency plans. Until these RC units deploy, AC units and allies would stabilize the threat. Implied in all recent discussions, is the premise that the preponderance of our nation's land power would be in the Reserves.

We have all noted, with pride, the reaction of the many Army Reserve and National Guard combat support (CS) and combat service support (CSS) units deployed for *Desert Shield*. But if ALBF is to be our doctrine, it must, therefore, be executable by our RC forces. And as we are no longer the dominant world political, military and economic power, allies are even more important for mobilization–based force capability than they were for our deterrence–based capability. In fact, proacative involvement with our allies is the *sine qua non* for regional collective security.

So there are at least three different Army land power capability combinations that must be

served by any general Army war–fighting doctrine:

- Forward–Deployed and Contingency Forces. These must be highly professional, immediately ready forces (the Active Army).
- Strategic Reserve Forces. These are largely RC–trained soldiers in units (both National Guard and Army Reserve, in units and as individual replacements).
- Mobilization Force. This is the force required to win a major world conflict, and consists of units that exist only in force planning documents. This land power reserve initiates individual and unit training after the declaration of mobilization.

All three major force packages assume there would also be allies, and sometimes these allies may be "discovered" for near–term expedient reasons at the outbreak of conflict. Essentially, they would probably be regional allies who do not declare until the threat develops. A prime example from *Desert Shield* is Syria.

Therefore, to be a general doctrine, ALBF (or ALB as we are discovering for *Desert Shield*) should be "doable." In some degree, all these various groups should be able to execute the doctrine—despite the inevitable, considerable variations in quantity and quality of personnel, available equipment and appropriate training within the deployed theater force. This would seem to be a difficult, but not impossible, task if it is addressed early in the CBRS. But there are some really tough questions that have to be addressed.

A young boy waving goodby to a family member departing for Saudi Arabia.

Many of the small units of the combat brigades mobilized for* Desert Shield *come in their entirety from small rural towns. Aside from the tragedy of battle, heavy combat, with all associated casualties concentrated in a small town, would be a national media disaster with potentially serious negative effects at the strategic level.

Forward Deployed and Contingency Forces

Under ALBF, forward deployed and contingency forces would need a notable upgrade of current capability, consistent with the steady evolution of doctrine since the active defense of the 1970s. As long as the current quality of the individual soldier is maintained, the obstacles to implementation will be in the sustainment of necessary research and development progress and funding support for the necessary procurement to outfit the contingency force. These are not insignificant problems, but the eventual capability appears possible perhaps over a much longer period than is currently envisaged. If we return to conscription (with school and other deferments), the probable deterioration in soldier quality, along with the return of the various indiscipline indicators, will so distract the junior chains of command as to make genuine ALBF readiness unlikely in all but our elite units. The same impact could be expected on our capability to execute current ALB. *Just Cause* would have been exceedingly difficult under the full spotlight of the world's media with a conscript

force.

The size of the contingency force will also be a problem. Our doctrine, for both ALB and ALBF, along with popular support realities, demands rapid deployment of sufficient capability to ensure "quick victory." This causes the size of our deployment forces to go up almost geometrically, as seen in *Desert Shield*, or requires that the size of the threat we are prepared to meet rapidly and decisively must be reduced. With this perspective, those 30 states (each with at least 1,000 tanks) look much more formidable.

The bill to sustain a joint national capability could be reduced by augmenting the contingency force with selected Reserves (particularly CSS units to support deployability and theater sustainability) and anticipated reliance on some allied support, provided that there has been sufficient training in advance to ensure mutual readiness and confidence. This may be possible, but that mutual confidence in capability has been spotty during the relatively affluent Reagan years of ALB. There is a great premium on designing ALBF so that it can be executed by selected Reserves and allies.

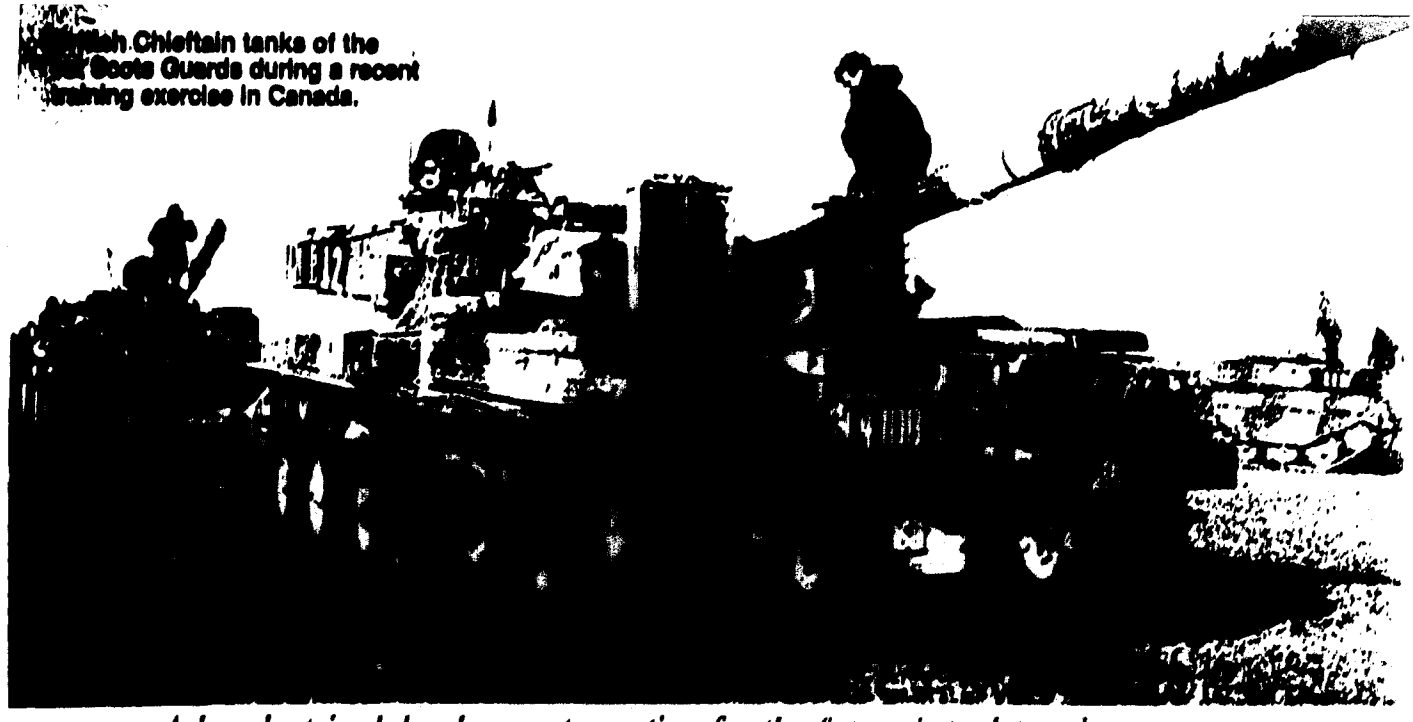
In all cases, capability by the other services is welcome insurance—assuming they, too, are prepared to support ALBF. The predominance and mission focus of the CJCS and CINCs, as provided under the Goldwater–Nichols Act, should serve to stimulate responsive joint development. Nonetheless, it appears *unlikely* that there will be national support for a contingency force capable of sustaining more than one deployed contingency corps. Thus, the "reinforcing forces" must be prepared to reinforce in larger contingency operations. They, too, must be ready to fight ALBF.

Reinforcing Forces

These make up today's Total Force, both in units and the Individual Ready Reserve. This is the "... army to deter, fight and win, anywhere, anytime—the mobilization-base Army."[4] Sustainment of this capability is a much more difficult problem. It fights as "the nation at war" with all that implies in terms of the essentiality of national support, both in Congress and the population at large. We are all familiar with the range of readiness challenges that confronts the Reserves. As we think through the compatability of ALBF with our RC forces, several considerations seem relevent.

First and foremost, the abiding force readiness requirement cannot and should not be fulfilled solely by AC forces, however much the Regular Army may want it to be. As a nation, a state and a people, the United States is the world's preeminent sea and air power. In these components of national military capability, we have genuine, absolute advantage. Land power was essential when our vital interests were threatened by a formidable continental land power—the Soviet Union. In our apparent Cold War victory, the national perception of need for major land power capability fades rapidly, consistent with our traditional uneasiness about large standing ground forces in a democracy. That national unease is a fact, concealed temporarily perhaps by the extraordinary land power presence required to deter the Soviet Union in the Cold War. Now in victory, it returns, and the Army seems on the verge of regressing to its more traditional role of "second fiddle" to sea power and now perhaps, air power.

Under these circumstances, the best insurance for continuing national support for land power is probably the RCs under federal (US Army Reserve) and state (Army National Guard) authority. Control should be distributed nationally, but these organizations could be governed regionally and manned with dedicated, competent citizen–soldiers. To prosper in the post–Cold War environment, as our nation searches understandably for the proper judicious mix of land, sea and air power to defend our interests, the AC may need the Reserves to sustain land power capability far more than the Reserves need AC support in reinforcing credibility in the eyes of the American people. Neglecting the capabilities and limitations of the Reserves when formulating ALBF would be folly. In fact, the Reserves should be encouraged to play a major role in securing the substantial force upgrade



British Chieftain tanks of the Scots Guards during a recent training exercise in Canada.

A key doctrinal development question for the future is to determine what modifications to current ALB doctrine, and the coming ALBF doctrine, are necessary to make it both desirable and feasible for our Reserves and allies to execute with confidence. The doctrine must elicit both the confidence of these forces and that of the professional military that counsels the president. Without this, we simply do not have a credible doctrine.

that will be required for both Active and Reserve forces in fielding ALBF as presently designed.

While it is clearly essential to have a well-balanced AC force, ready to fight and win in all intensity combat (including special operations), it does not necessarily follow that the Reserves should also be so structured. It may be better to tailor Reserve forces intended to reinforce in major contingency operations (such as *Desert Shield*) to fight in *only* those mission areas where US land power has clear comparative advantage. In such an arrangement, RC capabilities would be focused in those areas where we have a relative national advantage. Fire support, intelligence/electronic warfare (IEW), command and control and CSS come to mind—all areas where timely intervention capability could clearly provide an advantage to less prosperous regional allies. We do not have comparative advantage in maneuver forces, particularly in infantry forces.

In the debate over *Desert Shield* options, the American public is again making its uneasiness about casualties apparent. But it must be known and understood that someday, when a commander cannot find a less costly way to accomplish the mission, AC tank and infantry forces may have to attack fortified positions to seize city "X-ray." It is inconceivable that National Guard combat units could be so tasked routinely in contingency operations for anything less than another world war involving total national commitment and sacrifice.

One of the great strengths of the National Guard, in particular, is the exceptional cohesion gained by townsmen fighting together. Many of the small units of the combat brigades mobilized for *Desert Shield* come in their entirety from small rural towns.[1] Aside from the tragedy of battle-borne combat, with all associated casualties concentrated in a small town, would be a national media disaster with potentially serious negative effects at the strategic level. The potential cost to national support for contingency operations caused by concentrated citizen-soldier casualties is far greater than the benefit of combat reserve forces, however proficient they may be.

Reserves are not a credible combat capability for contingency operations when it seems that half the battle is sustaining the will of the American people. It would be far better to have RC

combat multipliers (in the form of CS and CSS troops) ready to support the ground maneuver forces of our allies who have presumably asked us

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to intervene.[7] The major RC role in the *strategic reserve* would be to provide the balanced capability for fighting the theater war en route to the nation at war.

Based on this line of thinking, it may be useful to design reinforcing force contribution to contingency operations to enable ALB/ALBF execution by coalition forces. Reserve CS and CSS units could be organized and trained to be rapidly available to upgrade the forces of selected allies to allow for synchronized action with US *contingency forces* in the objective area.

Sustained Reinforcing Force

This is the stand-by, unconstituted part of the *strategic reserve force*. It is the Army of total mobilization, with force generation requirements similar to those faced in World War II. The doctrinal problem here is different. Presumably, when this force is needed, the AC standing forces will have consumed the high-tech weapons procured before war. The emerging force arriving at the training centers is conscript. The quality cadre of prewar days is already gone, although there may be seasoned veterans returning from combat.

Of course, this is a demanding challenge; but the critical point is that the Army which existed before war—the high-quality Total Force which enabled ALBF—is gone, consumed on the battlefield. ALB seems unlikely to be relevant to our follow-on forces unless its requirements are degraded to match the diminishing capabilities of our weakened and emerging forces. If such a scenario becomes the reality, we must ask what exactly will the doctrine require? This may seem to be a trivial issue; it is not. Even if we accept this reality now, the buyout cost of ALB/ALBF is going to be so great in the face of post-Cold War funding constraints that there will be few resources left to devote to acquiring the quantities of the high-value materiel needed to upgrade the smaller AC and RC contingency and reinforcing forces. The production base and the draft boards will need virtually immediate resource allocation guidance. As we prescribe in the CBRS, doctrine will drive the requirements. What will the doctrine be? What are the degraded mode options for ALBF?

There may be a particularly important mission in the sustained reinforcing force for National Guard combat units. There is a clear need to draw upon the pride and patriotism of historic Guard units, many of which have combat records exceeding those of famous AC regiments. As discussed above, it seems that regional contingency operations, guided by ALB/ALBF, are neither the time nor the place for excellence in Guard maneuver forces. Perhaps they could become the combat cadre for the sustained reinforcing force units?

The issues that have been discussed here are not welcome subjects. In fact, they are downright unpleasant. But they are the kinds of issues that must be addressed forthrightly as ALBF is molded. If not, we will end up with a war-fighting doctrine that is an expensive myth, politically satisfactory in peacetime, but a ticking national time bomb in war. Some could say that we have precisely that situation today with National Guard roundout brigades incorporated in AC organizations to preserve ALB divisional structure, without serious expectation that they would have to develop competency to actually fight ALB or be subject to the heavy losses of the modern battlefield in contingency operations. A

key ALBF development question must address how the doctrine can be shaped to permit genuine Total Force combat readiness, while avoiding the dangers of heavy localized casualties.

Competing Requirements

There will be important complementary, yet competing, requirements as ALBF molds the materiel, organizational, personnel and training requirements for the future Army. Unfortunately, even if we end up with an apparent "net gain" in capability after *Desert Shield*, there are other long-term shortfalls that need to be addressed and will compete with ALBF.

We have not completed our last "revolution" in doctrine and fielding of the organizations and equipment to execute ALB across the entire force. Largely due to six years of declining budgets, most National Guard divisions are, at best, marginally equipped to fight ALB today. There are many residual issues from the changes mandated by the Army of Excellence (AOE) force structure concept during the past several years.

Under AOE, theater forces were sized for a developed theater, specifically to address our most important problem, NATO defense. Western Europe has significant public infrastructure and host nation support available. Absolutely reasonable expectations of local support permitted us to reduce the number of support units in the Europe-reinforcing force. Because of the overall success of our policies in Europe, we never had to test the adequacy of our planning. That test has now come, as a Europe-size US force is deployed on *Desert Shield* in a barebase theater.

AOE "shaved the excess" from the Army in order to squeeze two more divisions from a constant total personnel strength. The lower manning requirement became the new objective in our modernization effort. Statistical health notwithstanding, there is pernicious anemia in the current force. This will have to be corrected, drawing on the wisdom acquired in *Just Cause* and *Desert Shield*—another bill to be paid in ALB before ALBF comes.

AOE also assumed accelerated introduction of labor-saving devices and other new technologies such as improved fuel storage and distribution, better materiel-handling equipment and new feeding systems. The reality has been shortfalls, slowdowns due to funding constraints and just plain bad decisions mixed with the good. Overall these initiatives have been a benefit, but again there are significant bills yet to be paid. None of these are show-stoppers to ALBF.

ALBF seems unlikely to be relevent to our follow-on forces unless its requirements are degraded to match the diminishing capabilities of our weakened and emerging forces. . . The buyout cost of ALB/ALBF is going to be so great in the face of post-Cold War funding constraints that there will be few resources left to . . . upgrade the smaller AC and RC contingency and reinforcing forces.

However, they do remind us that there are outstanding obligations that must be met before we transition into ALBF. Unfortunately, most seem to be debits.

Another tough problem is the pacing of change. During the last "revolution," as we created ALB by changing our doctrine, organizations and equipment simultaneously, we learned the limits of competence. There is a finite number of major actions that can be done well at one time. A major issue for ALBF is the larger context in which it is to develop. Several questions suffice to bring out these kinds of issues:

- What are the other major competing priorities for the Army during the same period?
- Where does ALBF fit in the post-Cold War period, with simultaneous national transition to the information economy? Might that change the national perspective on volunteer forces? How sensitive is ALBF to a conscript force?
- ALBF will require considerable improvement of some ALB capabilities not yet in the

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hands of ALB fighters (such as improved acquisition, expanded long-range fire support and major new systems such as air-to-surface missiles and light helicopters). What are the expectations of funding?

We will never know some of these answers; uncertainty is a fact of life. Some risk is inevitable if we are to advance. Even with all of this understood, however, it seems prudent to assume that as an institution our margin for error may be going down for all the reasons discussed above. Should we not ask whether it would be a better return on resources in "building down" the Army to complete ALB assimilation before we entertain ALBF? Perhaps we should complete ALB for the Total Force, our key allies and even our joint US forces. For a change, we ought to get the US Air Force and US Marine Corps fully "on board" as we hone and war game the new doctrine, drawing on their input, as well as emerging simulation technologies. We should also consider whether it might be better to "fix" ALB to only address specific objections from CINCs, particularly after *Just Cause* and *Desert Shield*, and drawing on appropriate lessons learned.

We all know there is much to be done with ALB. Perhaps ALBF has developed a bureaucratic life of its own—distinct from significant changes in the world situation that have occurred in the last two or three years? Nevertheless, the issues evolve into a question of *when* we move to ALBF, not *if* we intend to. As technology and the battlefield change, we simply cannot afford not to do so. We need to retain the ALBF vision as an essential lodestar as we adjust to post-Cold War realities. We must also accept that the threat, money and normal political processes may place us into a 20- to 30-year transitional period.

In sum, ALBF is very useful, conceptual work, which is clearly necessary to the "futures" effort that must continually address how the Army will fight. However, as we implement, we should ensure that we understand the substantial "policing up" still required to implement ALB, particularly now as the nation's leadership realizes what ALB entails as a result of their heightened interest in *Desert Shield*. We also need to mesh the diverse capabilities and requirements of our Reserves and our allies into the evolving doctrine. Then the Army clearly needs to gauge the post-*Desert Shield* national will, the changing national defense realities and the national "pocketbook."

NOTES

1 Army Chief of Staff White Paper, *The United States Army: A Strategic Force for the 1990s and Beyond*, January 1990, 3.

2. This in no way detracts from the enormous contribution of our forward-deployed forces for more than 40 years. But they were seized with the challenges of sustaining virtually immediate readiness. Somebody had to stand back and apply the long strategic view and ensure that we presented an absolutely consistent "solution." That was the US Army Training and Doctrine Command's responsibility, increasingly copied by other military establishments.

3 Presidential News Conference, 30 November 1990.

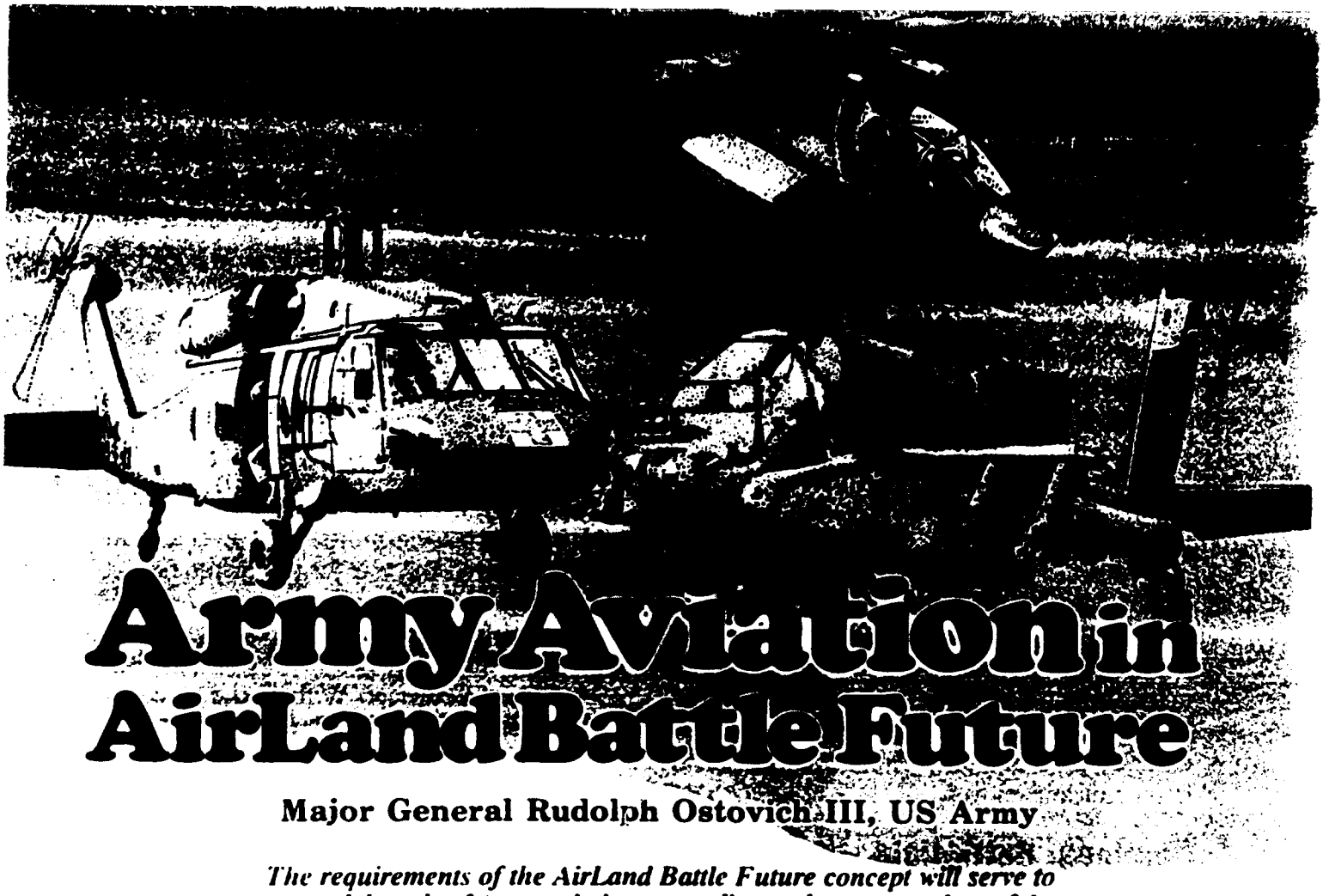
4 LTG Frederic J. Brown, US Army, Retired, "The Uncertain Path," *Military Review* (June 1990):6.

5. The Reserves are noted for their skillful capability to secure Congressional funding sometimes in spite of the Active Force. One wag described Guard funding distributed locally as the "last great pork barrel."

6. Almost all the 139 soldiers in one Louisiana Guard Mechanized Infantry Company mobilized for *Desert Shield* live within 20 miles of each other. "In small towns, Guard is family," *Army Times*, 26 November 1990, 20.

7. This is the approach taken by Senator Sam Nunn for force projection in his proposed national defense policy. *Senate Remarks*, "A New Military Strategy," 19 April 1990, 12

Lieutenant General Frederic J. Brown, US Army, Retired, a former chief of armor, resides in McLean, Virginia. In addition to commanding an armored brigade in the 2d Armored Division, he served in Vietnam, the Continental United States and Europe. His article, "The Uncertain Path," appeared in the June 1990 issue of Military Review.



Army Aviation in AirLand Battle Future

Major General Rudolph Ostovich III, US Army

The requirements of the AirLand Battle Future concept will serve to expand the role of Army aviation, according to the commandant of the Army Aviation School. He envisions aviation attack formations of brigade, and perhaps, larger size performing the decisive actions formerly reserved for armor and infantry formations. He concludes that the versatility of the helicopter will allow Army aviation to play a critical role across the operational continuum.

THE ESTABLISHMENT of a new, more cooperative relationship with the Soviet Union has given the US Army an opportunity to achieve a more balanced posture of forward deployed and Continental United States (CONUS)-based forces. Our global orientation and national security interests, however, have by no means been diminished. The seemingly contradictory vectors of reducing the size of our Army, rendering full support to our soldiers confronting aggression in Southwest Asia and remaining prepared to respond to other possible contingency requirements have spread our land forces thin. The challenges this situation presents to our existing and future forces will be satisfied by better-equipped, well-trained soldiers. We can expect future battles to be fought by forces that are integrated combined arms organizations working closely with our sister services and allies. Joint and combined warfare will continue to be the norm. It is in this environment that Army aviation, as an integral part of our land forces, has a new and exciting opportunity to make a significant contribution to warfighting.

As we look toward the future, a concept emerging to address the security challenges of a dynamic world situation is called AirLand Battle Future (ALBF)—an evolutionary next step to our current how-to-fight doctrine. Our assessment concludes that with a reduction in forces, fewer units will be expected to operate over greater distances. Combat units will be frequently separated from one another, and gaps will exist. The battlefield will be nonlinear. Our forces

With a reduction in forces, fewer units will be expected to operate over greater distances. Combat units will be frequently separated from one another, and gaps will exist. The battlefield will be nonlinear. Our forces will need to capitalize on our ability to employ lethal long–range fires and on the agility of tactical air and organic Army aviation units to respond to enemy weakness.

will need to capitalize on our ability to employ lethal long–range fires and on the agility of tactical air and organic Army aviation units to respond to enemy weakness. The need to synchronize and maintain the initiative will remain important imperatives.

Nonlinear Battlefield

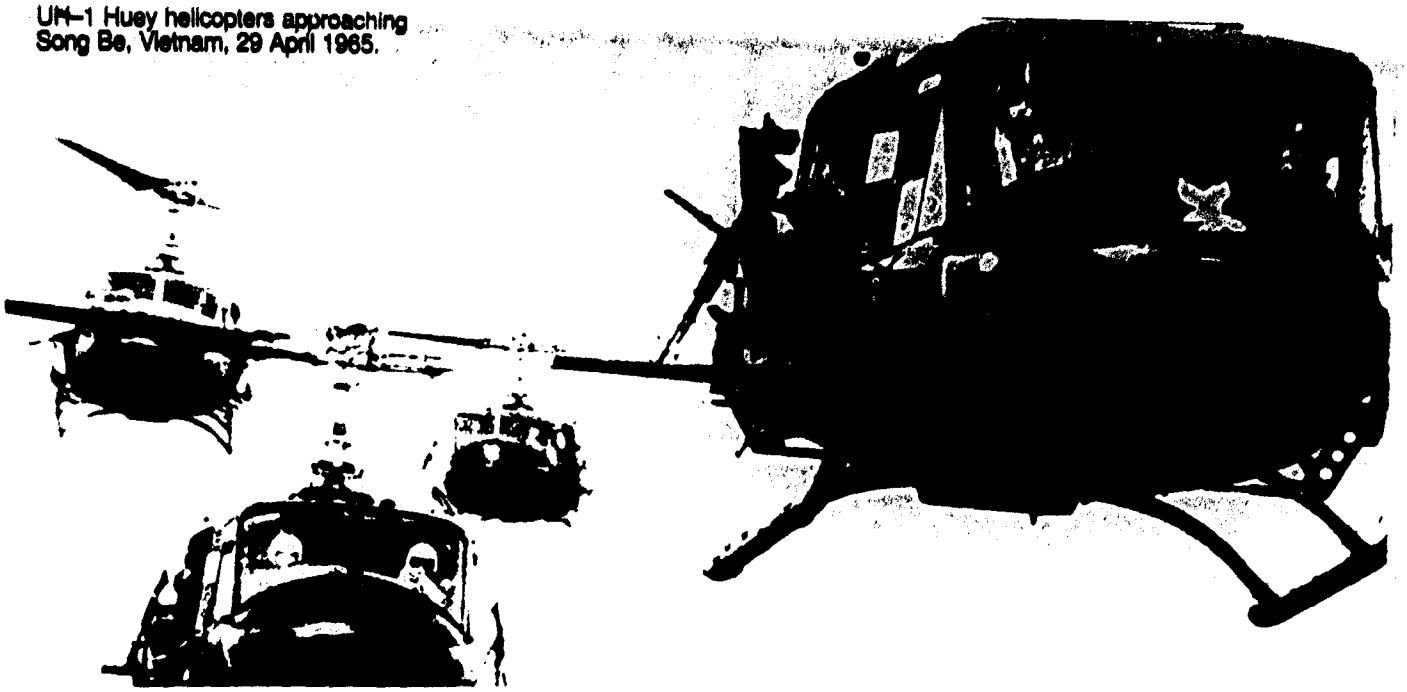
Fighting on a nonlinear battlefield is not new. Nearly a decade of warfare in Southeast Asia, followed by quick responses to conflicts in Grenada and Panama, gives ample evidence of our military experience in this arena. The current situation in Saudi Arabia is no exception. Our present doctrine, US Army Field Manual, 100—5, *Operations*, recognizes the possibility and probability of battlefields becoming fluid and ill–defined. The nonlinearity described in this manual, however, indicates that combat actions create this situation and that those operations, once successful, will foster a return to a linear arrangement of forces. ALBF, in contrast, begins with the premise that units and formations are in noncontiguous array prior to the initiation of combat operations.

The need for rapidly deployable and mobile forces has been recognized for some time. Former Secretary of Defense Robert S. McNamara identified the need for improved mobility (tactical, operational and strategic) in 1961. Dissatisfied after his review of Army plans for modernization, McNamara charged the Army to study the use of aircraft, primarily the helicopter, as a possible bold, new way to enhance battlefield mobility vis–á–vis ground transportation systems. McNamara emphasized the importance of his directive by stating, "I shall be disappointed if the Army's reexamination merely produces logistically oriented recommendations to produce more of the same, rather than a plan for employment of fresh and perhaps unorthodox concepts which will give us a significant increase in mobility."[1] The studies and procurement actions stemming from McNamara's concern, coupled with our increasing military involvement in Vietnam, paved the way for the maturation of airmobility.

The terrain and nature of the enemy in Vietnam made this the war of the helicopter; this was a revolutionary concept. Without the introduction and evolution of the aircraft and airmobile tactics and techniques, the successes on the nonlinear battlefields upon which we fought could not have been achieved. Many of the very successful tactical operations, logistics resupply, firebase support and medical evacuation operations could not have taken place without the superior mobility of the helicopter. Airmobility gave US forces a tactical advantage over the elusive, unconventional Vietcong and often larger conventional North Vietnamese Army forces. General Vo Nguyen Giap, North Vietnam's defense minister, stated that Vietcong and North Vietnamese soldiers feared the sounds of our helicopters more than anything else on the battlefield. Helicopters proved to be the only means to efficiently and effectively exploit the nonlinear nature of battlefields in Southeast Asia.

Nearly 30 years later, we now face similar tactical, operational and strategic deployability and mobility concerns. ALBF envisions forward–deployed and CONUS–based units postured for global contingency operations across the entire continuum of conflict. Our mission and, indeed, the challenge of ALBF, is to get our forces where they are needed and, once there, to provide the mobility and lethality essential to the success of maneuver warfare. It is clear that we face an important juncture for the future.

UH–1 Huey helicopters approaching Song Be, Vietnam, 29 April 1965.



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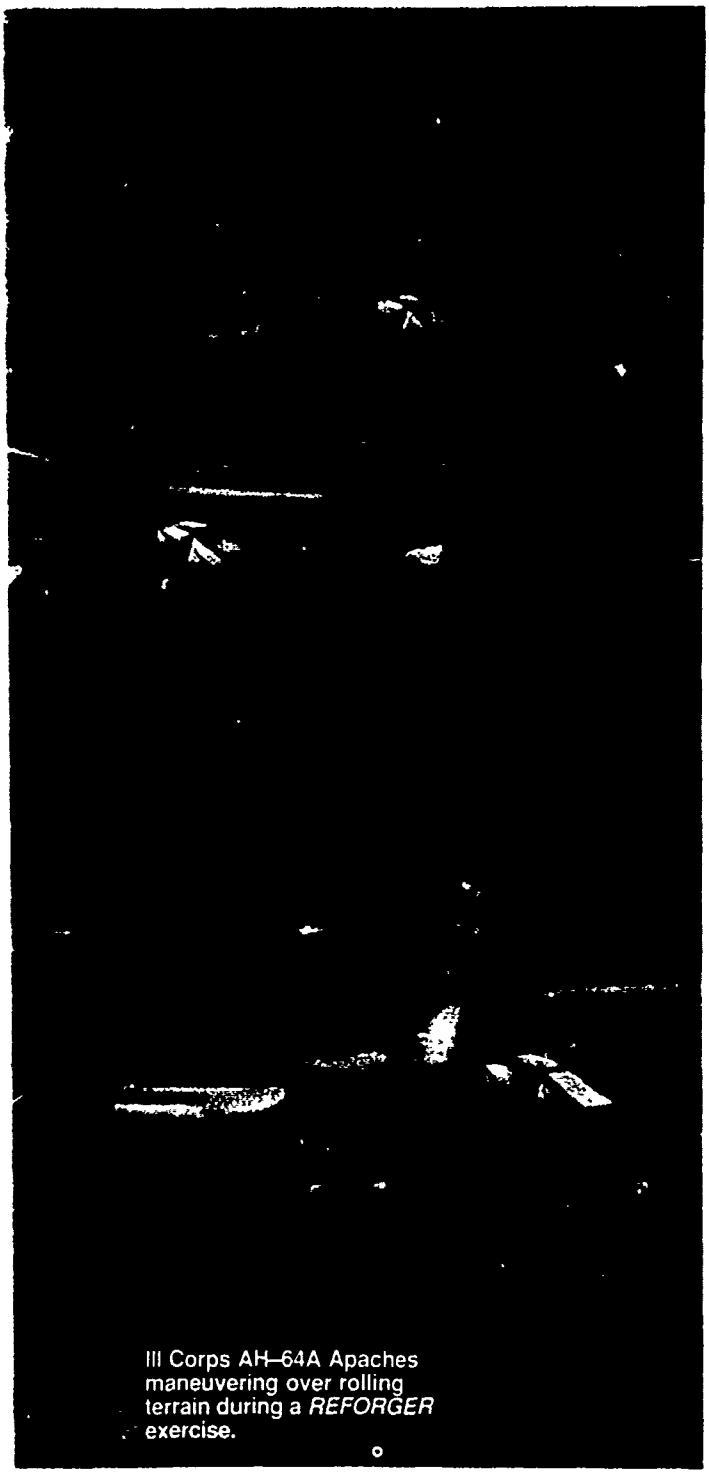
Army Aviation

Army Aviation stands at the threshold of a unique opportunity, an opportunity to write a new chapter in the book of land warfare—one that capitalizes on its inherent versatility, lethality and deployability. Aviation will play a more important role than ever before on the future battlefield. To this point, General John W. Foss, commanding general, Training and Doctrine Command, has written: "Army Aviation is a key link in the evolutionary change in warfare. Aviation has redefined mobility and mobile firepower on the battlefield."[2]

The four stages of ALBF provide a convenient format for placing aviation's contribution into perspective. They are detection–preparation, establishing conditions for decisive operations, decisive operations and reconstitution.

Detection–Preparation. This stage uses national–, operational– and tactical–level sensors to provide near, real–time intelligence data and processed information directly to maneuver commanders. Although the projected sensor systems will be high–confidence performers, validation of data by visual means remains a critical task. This validation requirement is ideally suited for cavalry forces. Presently, aviation—and especially air cavalry units—are custom–made for reconnaissance and surveillance missions and will become an even more critical asset in the future. With the addition of the Longbow millimeter wave radar, the AH–64 Apache and LH (light helicopter) will significantly enhance our detection and target.ng capabilities. When you add to the equation Forward–looking infrared radar, low light television and direct–view optics, and also consider the mobility advantage offered by helicopters, it is obvious that an aviation–heavy force will be an important element of cavalry operations. Nonlinear warfare demands balanced, air–ground cavalry regiments to help define the battlefield and to provide continuous information on where the enemy is—and where he is not.

Conditions for Decisive Operations. The establishing of conditions for decisive operations stage of ALBF is where long–range, lethal weapons systems come into play. It is here that attack aviation can best combine its speed and firepower with that of extended range artillery and tacti-



III Corps AH–64A Apaches maneuvering over rolling terrain during a *REFORGER* exercise.

Massed attack helicopter formations of brigade size and larger will combine the elements of speed, surprise and lethality with a marked night–fighting advantage over the enemy. Instead of committing attack aviation units piecemeal in support of the main attacks of armor and infantry formations, ALBF provides the framework for decisive action, employing attack aviation en masse.

cal air systems. During this stage, enemy formations will be weakened and possibly destroyed through the application of precise firepower delivered at extended ranges. The ability to synchronize long–range artillery, tactical air and attack aviation (before our own ground forces come into range of enemy fires) will serve to preserve our forces for the direct fire fight of the maneuver phase.

Massed attack helicopter formations of brigade size and larger will combine the elements of speed, surprise and lethality with a marked night–fighting advantage over the enemy. Instead of committing attack aviation units piecemeal in support of the main attacks of armor and .nfantry formations, ALBF provides the framework for decisive action, employing attack aviation en masse. Massed attack helicopter formations provide the corps commander a maneuver asset that can influence the operational level of war, well before ground force engagement is possible. Maneuver of air assets during this stage need not be aviation pure. In fact, airmobile–inserted combined arms teams that can attack and destroy key command and control nodes and logistics facilities or disrupt lines of communications could play a critical role in the operation.

Decisive Operations. The decisive operations stage will likely be the point in ALBF where ground and air maneuver brigades bring about the final destruction of enemy forces. These combined arms brigades will seize the initiative from what, at this point in the battle, should be a confused and fractured enemy. The focus of this offensive–oriented tactic will be on the enemy force, not on terrain. Battles will be fought at night, when possible, so that our forces can apply their technological and training advantages. Divisional air cavalry squadrons will perform security operations necessary to maintain the offensive spirit, while corps air cavalry regiments protect the flanks of maneuvering divisional formations.

Reconstitution. Reconstitution follows the decisive operations stage. Well–developed, static, logistic systems are not envisioned, as future battles are expected to be short, intense

and extremely violent. Once the fight is won, the logistics support systems will move forward to join maneuver divisions or await the return of these units to the tactical support area for reconstitution. Aviation maintenance will be organized at two levels: user and depot. Battle damage repairs and other services will be performed within the division and corps aviation brigade areas. Components and major equipment end items will be overhauled, repaired and replaced at in-theater depot level. The lion's share of air operations will fall upon the shoulders of general support aviation to support and refurbish our forces.

The future importance of aviation cannot be addressed solely in terms of mid- or high-intensity conflict. The true relevance of an aviation force is in its application across the entire spectrum of warfare. It is reasonable to expect that low-intensity operations will continue to be a common requirement for our military forces. The scope of the low-intensity operation will determine the specific structure and employment tasks assigned to combat, combat support and combat service support aviation organizations. In addition, nationbuilding and security-assistance programs will draw heavily upon the capabilities of our aviation units. Heavy lift aircraft will provide critical logistic support for medical and engineering projects that are aimed at national infrastructure development and rebuilding. The training of host country personnel will require the assistance of our aviators and aviation soldiers.

Combat aviation answers the call to insurgency and countersurgency operations much as it would in the mid- to high-intensity environment. Aviation brigades will continue reconnaissance, security, attack, lift and aerial resupply operations to quickly and efficiently overcome the restriction of terrain. In Panama last year, Operation *Just Cause* amply demonstrated Army aviation's deployability, versatility and lethality in a classic, low-intensity scenario. The successes achieved through the simultaneous assault of 27 objectives on the first night could not have been possible without the contribution of Army aviation.

The decisive operations stage will likely be the point in ALBF where ground and air maneuver brigades bring about the final destruction of enemy forces. These combined arms brigades will seize the initiative from what, at this point in the battle, should be a confused and fractured enemy. The focus of this offensive-oriented tactic will be on the enemy force, not on terrain.

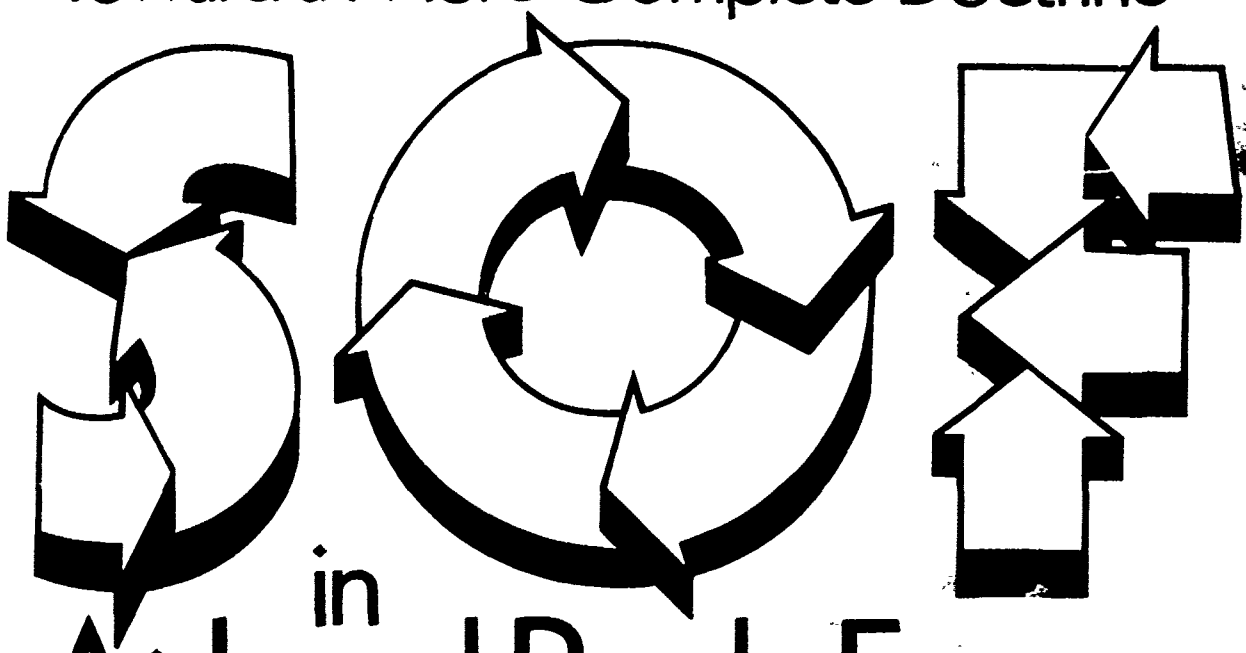
The chosen course for ALBF is ambitious yet well considered and achievable. Whether reinforcing forward-deployed units or responding to regional conflict on a contingency basis, Army aviation remains a relevant force. Its ability to deploy rapidly, exploit the night and quickly mass aerial firepower is a clear indication that Army aviation is a versatile and important member of the combined arms team, now and in the future. ***MR***

NOTES

1. LTG John J Tolson *Vietnam Studies Airmobility 1961-1971* (Washington, DC: Department of the Army, 1973), 19
2. GEN John W Foss "Challenges and Opportunities," *Army Aviation*, vol 39, 31 July 1990), 6

Major General Rudolph Ostovich III is commander, US Army Aviation Center, Fort Rucker, Alabama. He received a B.A. from Ripon College and an M.S. from George Washington University. He has held a variety of staff and command positions in Vietnam, Germany and the Continental United States, including commander, 11th Aviation Group, VII Corps, Germany; commander, 82d Aviation Battalion, 82d Airborne Division, Fort Bragg, North Carolina; deputy director for Plans and Policy, Headquarters, US Pacific Command, Hawaii; and deputy chief of staff for doctrine, Headquarters, US Army Training and Doctrine Command, Fort Monroe, Virginia.

Toward a More Complete Doctrine



in AirLand Battle Future

Major William H. Burgess III, US Army

As the debate begins to surface around the emerging concepts of AirLand Battle Future, practitioners will scrutinize its efficacy, especially in relation to current and future missions. The author argues that AirLand Battle Future must adequately address roles and capabilities of special operations forces and other players at the lower end of the operational continuum.

IN WHAT will be a US Army landmark and a conceptual watershed well into the next century, the concept of AirLand Battle is being revamped and rewritten. AirLand Battle Future (ALBF) is to focus "on the employment of the Army as the land component of US military power in the 21st Century."[1] The concept of ALBF is an excellent start that makes a vital departure from the former AirLand Battle by espousing *operational* (and not just tactical) combat on a *nonlinear* battlefield and recognizing "the need for doctrine for military involvement in peacetime and conflict."[2] It will go a long way toward completely dissipating the cloud that has hung over the Army since Vietnam, yet the concept simply needs to go further. It needs to be broader and to recognize, in a coherent fashion, the astonishing changes that will fashion the Army's needs well into the next century.

Simply stated, the evolving concept must address all Army capabilities for its entire range of missions at *all* salient points on the operational continuum. As currently discussed, any image of a "perfect operation—*a coup de main* where the US forces have such overwhelmimg combat power that the fight never really gets started"—is unattainable.[3] The best operation that can be undertaken by the Army is one in which the Army's role is invisible to the target; the target does to itself what is in the best interests of the United States; and the target never realizes that its behavior has been shaped by the United States. Although only an ideal, all other "type" operations descend on the scale of desirability from this one, with the most imperfect operation being protracted, high-intensity combat. The

coup de main, while more desirable than trench warfare, is far from the top of the list. Clearly, more work is to be done on ALBF in this area of doctrinal development.

Muddled and dated language causes major parts of the concept to be unclear and inconsistent such as the following:

"The national military objectives for the United States in the first decade of the 21st century will be . . .[to] [d]eter aggression against the United States and its allies at all levels of the conflict spectrum by fielding robust conventional forces backed by adequate nuclear capabilities to discourage escalation by hostile influences/forces."[4]

Aside from conjuring images of Pershing II missiles in El Salvador, such passages are defective in their reference to the "spectrum of conflict," which has long been supplanted by the eminently more useful "operational continuum" comprising peacetime competition, conflict and war.[5] AirLand Battle Future must no undervalue the Army's constitutional, statutory and historic role in the direct and indirect application of military and nonmilitary elements of power, particularly during peacetime competition and conflict. The prominent continuation of the word "battle" in the doctrine's name (as opposed to the more apropos "operation") is instructive and is perhaps one reason that the concept incorrectly does not attach to the operational continuum, which should form its spine. Indeed, the concept must not absent the term "peacetime competition" from the discussion.

In relating to the operational continuum rather than the more restrictive spectrum of conflict, war, conflict and "peacetime" competition are addressed as separate, unrelated abstractions, rather than as relative points on a single continuum. Current thinking places a premium on war and retains a central focus on reactive direct action, embodied in the notions of combat (armed battle) and battle (large-scale combat fought directly between two armed forces). Clearly, the role of the Army in proactive and preemptive indirect action all along the operational continuum, must be adequately addressed. Furthermore, ALBF must clearly delineate the dynamics between national interests, threats to those interests, missions for the Army to protect those interests and counter threats to them, and force requirements to perform those missions.

The best operation that can be undertaken by the Army is one in which the Army's role is invisible to the target; the target does to itself what is in the best interests of the United States; and the target never realizes that its behavior has been shaped by the United States.

The division of the Army's attention between "combat" and "noncombat" operations can result in false symmetry and will not identify the reality that so-called noncombat operations are the condition precedent and decisive force in shaping the time, place, intensity and even outcome of combat operations.[6] With such a vision, programs and force structure would be driven toward capabilities that, in an age of scarce resources, would limit the range of military options to direct combat operations. This logic invites war and provides impetus to escalate conflict and resolve situations through extreme violence rather than containing conflict at the lowest level consistent with the threat.

An appropriate and usable concept of ALBF must provide a stronger and more developed discussion of special operations forces (SOF), and of conflict and peacetime competition.[7] It should fully address the need for multiagency responses in situations in which the Army is but one (and not always the dominant) player. It also must show adequate appreciation for the value of indirect action such as intelligence operations, psychological operations (PSYOP), civil-military operations (CMO) and other activities of SOF as the *sine qua non* of direct action.

The five categories of future Army forces (forward deployed, contingency, reinforcing, nation assistance and unique mission) seem to

Peacetime Competition

A nonhostile state wherein political, economic, psychological and military measures, short of US combat operations or active support to warring parties, are employed to achieve national objectives. (JCS Pub 3–0)

Conflict

An armed struggle or clash between organized parties within a nation or between nations in order to achieve limited military or political objectives. While regular forces are often involved, irregular forces frequently predominate. Conflict is often protracted, confined to a restrictive geographic area, and constrained in weaponry and level of violence. Within this state, military power in response to threats may be exercised in an indirect manner while supportive of other elements of national power [emphasis added]. Limited objectives may be achieved by the short, focused, and direct application of force. (JCS Pub 3–0)

War

Sustained use of armed force between nations or organized groups within a nation involving regular and irregular forces in a series of connected battles and campaigns to achieve vital national objectives. War may be limited, with some self–imposed restraints on resources or objectives. Or, it may be general with the total resources of a nation or nations employed and the national survival of a belligerent at stake. (JCS Pub 3–0)

be garbled mission groupings that offer little improvement over the Army's current categorization of forces into light, heavy and SOF.[5] Additionally, greater emphasis must be placed on threat intentions than on threat capabilities.[6] The latter is reminiscent of the Army's post–Pearl Harbor plan to reinforce and defend the Pacific Coast from the Bering Sea to Catalina Island, because the Japanese had the capability to strike "anywhere in the Pacific." The Navy more wisely focused on intentions and eventually defeated the Japanese at the Battle of the Coral Sea.

Doctrine, Law and History

The Constitution, National Security Act of 1947 as amended, Department of Defense Directive 5100.1, historical precedent and current practice consign the Army to conduct operations within the framework of national policy all along the operational continuum. World realities and domestic concern for minimizing American casualties and the costs of collateral damage dictate that the president, Congress and American people may trust the Army to be able and successful when so charged. The Army's future concept should embrace such legal and political expectations.

Current thinking places a premium on war and retains a central focus on reactive direct action, embodied in the notions of combat (armed battle) and battle (large–scale combat fought directly between two armed forces). Clearly, the role of the Army in proactive and preemptive indirect action all along the operational continuum, must be adequately addressed.

The Army's historic role is land power through establishing and maintaining land control that affords the National Command Authority *flexibility* in terms of the range of political and military options available to it. The Department of the Army has overall responsibility for the preparation of those land forces necessary to meet strategic and operational challenges to US security interests across the operational continuum. The Army is, therefore, organized into light, heavy

US Army engineer and Salvadoran trainees inspect a commercial metal detector.

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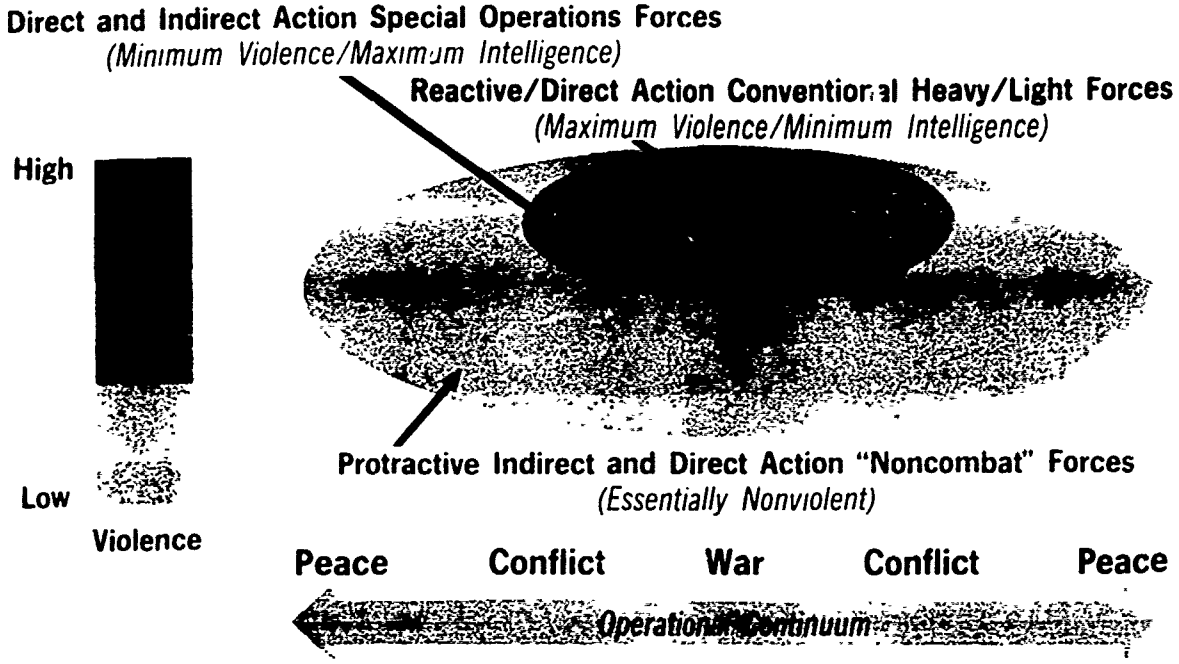
and special operations forces. It is designed, along with the other US military forces, to provide a visible, credible and realistic capability to support the nation's political initiatives; to reduce the probability of armed aggression against the United States; and, should armed conflict or war occur, to effectively resolve the conflict or war on terms favorable to the United States.

Implicit here is an imperative to keep military action at the lowest intensity proportionate to the threat and necessary to resolve the matter in the best interests of the United States. This is where the range of alternatives is broadest, and flexibility is greatest. Consistent with this, the first sentence of the preface of US Army Field Manual (FM) 100—5, *Operations*, 20 August 1982, stated in bold capital letters that "THE FUNDAMENTAL MISSION OF THE UNITED STATES ARMY IS TO DETER WAR." Implicit in the mission of deterring war is managing risk below the level of war.

The Operational Continuum

As the accompanying figure illustrates, the role of the Army in the projection and maintenance of land power extends across the operational continuum running from peacetime competition through conflict, war, conflict and peace again. The general degree and extent of violence in a given situation determines the name of a point on the continuum. Political and statutory declarations are arbitrary and of secondary importance in the definition of points on the continuum such as wars on poverty, drugs and so on. The Army has, for most of its existence, been designed to engage in the most violent activities on the continuum, the additional role of the classic combat arms of infantry, artillery and armor. Recently, however, the Army has developed the SOF to project and maintain land power across the *entire* operational continuum, with emphasis on conflict and peacetime competition.



The Army, Land Power, Violence and the Operational Continuum

Peacetime activities of the Army include the deployment of mobile training teams and the conduct of training with allied armies in situations of prolonged stability. Army activities in conflict include foreign internal defense advisory assistance to nations undergoing insurgency, CMO, PSYOP, counterterrorism, counternarcotics and the like. Army wartime activities include closing with and destroying enemy forces, seizing and holding key terrain, plus conducting direct action, special reconnaissance, unconventional warfare operations with SOF. Many of these activities are beyond the ordinary sense of combat and battle and are, in fact, quite nonviolent.

- The dominant type of military forces are associated with the level and nature of violence anticipated or experienced.
- Conventional heavy/light forces are associated with the highest levels of normally localized, reactive, short-duration, violent direct action.
- SOFs are associated with lower-intensity direct and indirect action spanning a broader range of time and place.
- "Noncombat" forces are associated with indirect action and the lowest levels of violence, where they also interact with a multitude of other agencies.
- If a proper fit has been made, these forces are specially tailored for the environment(s) in which they operate.
- "Noncombat" activities make up the bulk of the continuum, even during war.

Implicit here is an imperative to keep military action at the lowest intensity proportionate to the threat and necessary to resolve the matter in the best interests of the United States. This is where the range of alternatives is broadest, and flexibility is greatest.

There is generally a transition from one state of violence to another and (at the top of the figure) there can be situations with mixed levels of violence and where different types of forces operate simultaneously.

The figure also illustrates the "Matroshka Doll" analogy, which states that proactive, nonviolent and indirect approaches to the resolution of threats to the national interest are tried before reactive, violent and direct ones. This is because

the relative importance of military power increases as the level of indirect or direct violence increases, but as military action becomes more violent, the range of options is narrowed. The final point of the figure is that there is an incentive, in terms of freedom of action and flexibility, for the US Army to resolve military challenges at lower and less direct levels of violence, but there is also a need to be fully prepared to rapidly escalate to the highest levels of violence as the situation dictates.

A part of the Army's aim in developing SOF has been to meet and beat threats to national interests where they have been most intense, at the level of conflict. Technological advance, the popularization of mass conflict and the increased integration and sophistication of society have expanded the notion of battle to embrace almost any intense direct or indirect political, military, economic, psychological or social struggle, or a combination of these, waged by foreign or domestic adversaries at any point along the operational continuum. Furthermore, as technology advances and violent struggle becomes more popularized, the historical paradigm of maximum violence and minimum intelligence is reversed to maximum intelligence and minimum violence and a concomitant increase in the relative importance of special purpose forces, equipment and tactics. This is especially so in foreign internal defense, unconventional warfare and counterterrorism missions, counternarcotics programs and low-intensity conflict (LIC), where the threat may be intermixed with civilian populations.

The collective sense of critical Army activities has to extend well beyond the historic killing ground. Combat operations are now only a small part of a largely noncombat struggle, and are logically a last resort to violence when nonviolent means cannot prevail. So-called noncombat operations are thus not "additions," or "afterthoughts," but are essential prerequisites to battle.

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There has also been a growing realization on the part of US military theoreticians that the

Principles of War

Source: *FM 100-5*

Direct every military operation toward a clearly defined, decisive and attainable objective.
Seize, retain, and exploit the initiative.
Concentrate combat power at the decisive place and time.
Allocate minimum essential combat power to secondary efforts.
Place the enemy in a position of disadvantage through the flexible application of combat power.
For every objective, ensure unity of effort under one responsible commander.
Never permit the enemy to acquire an unexpected advantage.
Strike the enemy at a time and/or place and in a manner for which he is unprepared.
Prepare clear, uncomplicated plans and clear, concise orders to ensure thorough understanding.

parts of the operational continuum are not distinct steps with neat beginnings and well-defined endings, but are a dynamic, seamless web. What occurs at one point in the continuum can decisively shape other points and be a determinant of the outcome of the overall struggle. There is, for example, a direct correlation between the largely nonviolent, indirect, amorphous and proactive intelligence and PSYOP battles and the more often violent and direct combat arms battle. The US experience in Vietnam is a searing example of such. He who wins the intelligence and PSYOP battles may not have to wage the subsequent combat arms battle (or may wage it at lower intensity) and will have a far greater chance of operational and strategic victory than his adversary.

The Concept Required

The Army requires a future doctrine that is broad, sophisticated, and provides basic guidelines for the identification, assessment and management of risk in pursuit of national interests. It must support the Army's role as a *strategic* and *operational* force and must not put the Army's thinking in semantic stocks. The language must be clear and thorough, and be designed to cue the Army leaders who read it to make the correct intuitive decisions for the environment in which they operate. The doctrine that flows from the concept should be a tool and not a rule, and it must allow for graduated, proportionate re-

Special Operations Imperatives

Source: *FM 100-25, FM 31-20*

- Understand the operational environment.
- Recognize political implications of mission activities.
- Facilitate interagency activities.
- Engage the threat discriminately.
- Consider long-term effects.
- Ensure legitimacy and credibility of SOF mission area activities.
- Anticipate and control psychological effects.
- Apply SOF capabilities indirectly.
- Develop multiple options in response to mission area requirements.
- Ensure long-term sustainment.
- Provide sufficient intelligence.
- Balance security and synchronization.

LIC Imperatives

Source: *FM 100-20/AFP 3-20*

In LIC operations, political objectives drive military decisions at every level.

Military leaders must integrate their efforts with other governmental agencies to gain a mutual advantage in LIC.

Successful military operations in LIC require the armed forces to have the skill and willingness to change or modify structures or methods, and to develop new ones to accommodate each different situation.

Legitimacy is the central concern of all parties directly involved in a conflict, and it is also important to other parties who may be involved even indirectly.

Low-intensity conflicts rarely have a clear beginning or end marked by decisive actions culminating in victory. Developing an attitude of disciplined, focussed perseverance will help commanders reject short-term successes in favor of actions which are designed to accomplish long-term goals.

sponses to given situations. It should be a catalyst for inquiry, intuition and innovation.

The concept should first change its title to use the word "operation" in place of "battle." It should divide the Army's activities across the operational continuum, beginning with peacetime competition and then draw a dichotomy between direct and indirect action.

The next stage should be to articulate principles, imperatives and tenets that apply to these divisions. A conceptual basis for this can be found in the existing FM 100—5, FM 100—20/AFP 3—20, *Military Operations in Low Intensity Conflict*, FM 100—25, *Doctrine for Army Special Operations Forces* and FM 34—36, *Special Operations Forces Intelligence and Electronic Warfare Operations*. Within this context, for example, the principles of war and the old AirLand Battle operational concepts (initiative, depth, agility and synchronization) will continue to apply to high–intensity violence, while the SOF and LIC imperatives or variants thereof will apply to lower levels of violence and to peacetime competition.

The concept should build on the standard, tactically oriented battlefield operating systems (command and control, maneuver, intelligence, fire support, air defense, mobility and survivability, and combat service support). It should address the operating systems used by the Army at operational, strategic, joint and combined levels of activity, and identify the crossover points between each.

A direct correlation [exists] between the largely nonviolent, indirect, amorphous and proactive intelligence and PSYOP battles and the more often violent and direct combat arms battle. [Our] experience in Vietnam is a searing example of such. He who wins the intelligence and PSYOP battles may not have to wage the subsequent combat arms battle (or may wage it at lower intensity).

Throughout, the concept mus. recognize that the Army's role extends well beyond warfighting, and that our leaders must think in terms of achieving objectives without violence or with the minimum violence necessary. The concept must expand the province of Army thinking and increase its sophistication to embrace a multitude of less direct approaches to military problems. It must instill the idea that violent war comes only when more subtle methods have not succeeded in resolving the problem at a lower intensity. In the end, the concept of ALBF, by whatever name, must guide the Army to do the ri,ht thing for the nationai interest in the right place at the right time. ***MR***

NOTES

1 *Evolution of the Army Using Insights From AirLand Battle Future (Final Coordinating Draft)* (Fort Leavenworth, KS: Combined Arms Center, 11 September 1990), 6

2. *AirLand Battle Future Umbrella Concept (Final Coordinating Draft)* (Fort Leavenworth, KS: Combined Arms Center, 10 September 1990), 1

3 Ibid., 2–3

4. Ibid., 10

5. Joint Publication 3-0, *Doctrine For Unified and Joint Operations* (Washington, DC The Joint Chiefs of Staff, January 1990), I–6 to I–7; see also, US Department of the Army Field Manual 100–25, *Doctrine for Army Special Operations Forces (Final Draft)*, (Fort Bragg, NC US Army John F Kennedy Special Warfare Center and School, November 1990)

6 *AirLand Battle Future Umbrella Concept*, 14–21

7 Ibid., 18, 21 and 29–31

8 Ibid., 16–21.

9 Ibid., 2, 3, 7, 12, 49 and 51.

10 *Evolution of the Army*, 6

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See Deep Shoot Deep

UAVs on the Future Battlefield

Miles A. Libbey III and
Major Patrick A. Putignano, US Army, Retired

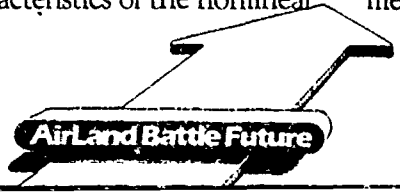
A key part of the emerging AirLand Battle Future doctrine requires the optimum use of technology to effectively operate on the envisioned nonlinear battlefield. The authors point out that unmanned aerial vehicles (UAVs) have capabilities that can significantly enhance operations. They describe several available and emerging UAV technologies and their potential uses on tomorrow's battlefield.

The unmanned vehicle today is a technology akin to the importance of radar and computers in 1935.
—Edward Teller, 1981[1]

THE ARMY has been very forward thinking about unmanned aerial vehicles (UAVs) over the last decade and is still the leader among the US services in their practical and conceptual development. The US Army's emerging concept for warfighting on a nonlinear battlefield, AirLand Battle Future, is the first operational concept that naturally lends itself to integrating UAVs smoothly into a US service war-fighting doctrine. UAVs will play a significant role in AirLand Battle Future because the proposed doctrine emphasizes deep reconnaissance, target acquisition, lethal UAVs and smart munitions. In addition, the characteristics of the nonlinear battlefield—fewer [illegible]s, rapidity of action, fluidity and flexibility—will put a premium on UAV capability.

The Aquila Remotely Piloted Vehicle (RPV) still comes to the minds of many when discussing RPVs in the Army. On one hand, Aquila was a disappointment because it was never deployed. On the other hand, Aquila laid a firm foundation on which to build affordable and deployable UAV systems. The message in this article emphasizes the positive—forget Aquila and let us get on with the business of improving our war-fighting capabilities.

The Aquila program entered a full-scale development in 1979, but became too costly for a number of reasons. Industry and the government shared in the inability to solve development and procurement problems that eventually



stretched the program to intolerable lengths and prevented production because of unacceptable costs. Several Aquilas are still in storage in Army depots, disappointing many because available technology never came to fruition. Nevertheless, the mission for which the Aquila had been designed is as valid today as it was in the late 1970s: "to detect targets in enemy territory and to direct conventional artillery and laser–guided munitions against them."[2]

UAVs in the military have a longer history than this example of Aquila would suggest. The era of UAVs was born in the United States soon after the Wright brothers conducted their first manned flight at Kitty Hawk, North Carolina, in 1903. In 1917, the Army Signal Corps had the Dayton Wright Company build the Kettering Bug—an unmanned biplane capable of delivering a bomb.[3] However, with the end of World War I, the first era of UAV development ended in the United States, lacking full acceptance. It began a pattern that has been repeated. During the heat of combat, UAVs are developed; yet when the loss of life ends, interest fades.

As a result of World War II, the United States reentered the unmanned system arena by requiring large numbers of target drones for Army and Navy gunnery practice. In addition, B–17 and B–24 bomber aircraft were modified for remote control bombing missions (after the pilot bailed out) against targets in Europe. Following World War II, UAV efforts in the United States centered on converting manned aircraft into target drones. During the Korean conflict, standard aircraft were modified to carry explosives by remote control to a target, but the efforts never obtained a stronghold in any of the US services.

In the 1960s, conflict again stimulated the US need for UAVs. The escalation of the Vietnam War required the operational and mission capabilities provided by reconnaisance drones. The need for this capability was readily apparent, and more than 3,000 UAV missions were flown in Vietnam using many versions of the Firebee.[4]

Paralleling the US experience, Israel (the only country to aggressively develop, use and improve UAVs) has been motivated by the realities of combat. The Israeli investment paid off in June 1982 during the invasion of Lebanon. The relatively simple Mastiff and Scout mini–UAVs led the advance into the dangerous Bekáa Valley, undertaking key decoy work and gathering reconnaissance data on Soviet–supplied surface–to–air missile (SAM) sites.

UAVs will play a significant role in AirLand Battle Future because the proposed doctrine emphasizes deep reconnaissance, target acquisition, lethal UAVs and smart munitions. In addition, the characteristics of the nonlinear battlefield—fewer forces, rapidity of action, fluidity and flexibility—will put a premium on UAV capability.

Flying into the Bekáa Valley, the UAVs emitted electronic signals that mimicked radar signals from Israeli jets. When the Syrians activated their short–range radars in response to the perceived threat, the UAVs identified and passed on their locations and characteristic radar emissions via an E–2 Hawkeye, enabling Israeli missiles to destroy 29 SAM sites in a single hour. With the enemy air defenses crippled, fighters then swept into the valley for cleanup operations, as the UAVs continued to monitor for bomb damage and the movement of Syrian forces. Not a single Israeli aircraft was shot down that day.

These combat lessons learned from the Bekáa Valley renewed US focus on unmanned systems. The United States is pursuing several lethal and nonlethal programs. Their procurement and employment in AirLand Battle Future is a departure from peacetime neglect that has characterized UAV development in the past.

UAVs on the Nonlinear Battlefield

The commander will require a variety of systems to support his operations on the battlefield. These systems can vary widely in range, time on station and payloads, and thus support him in

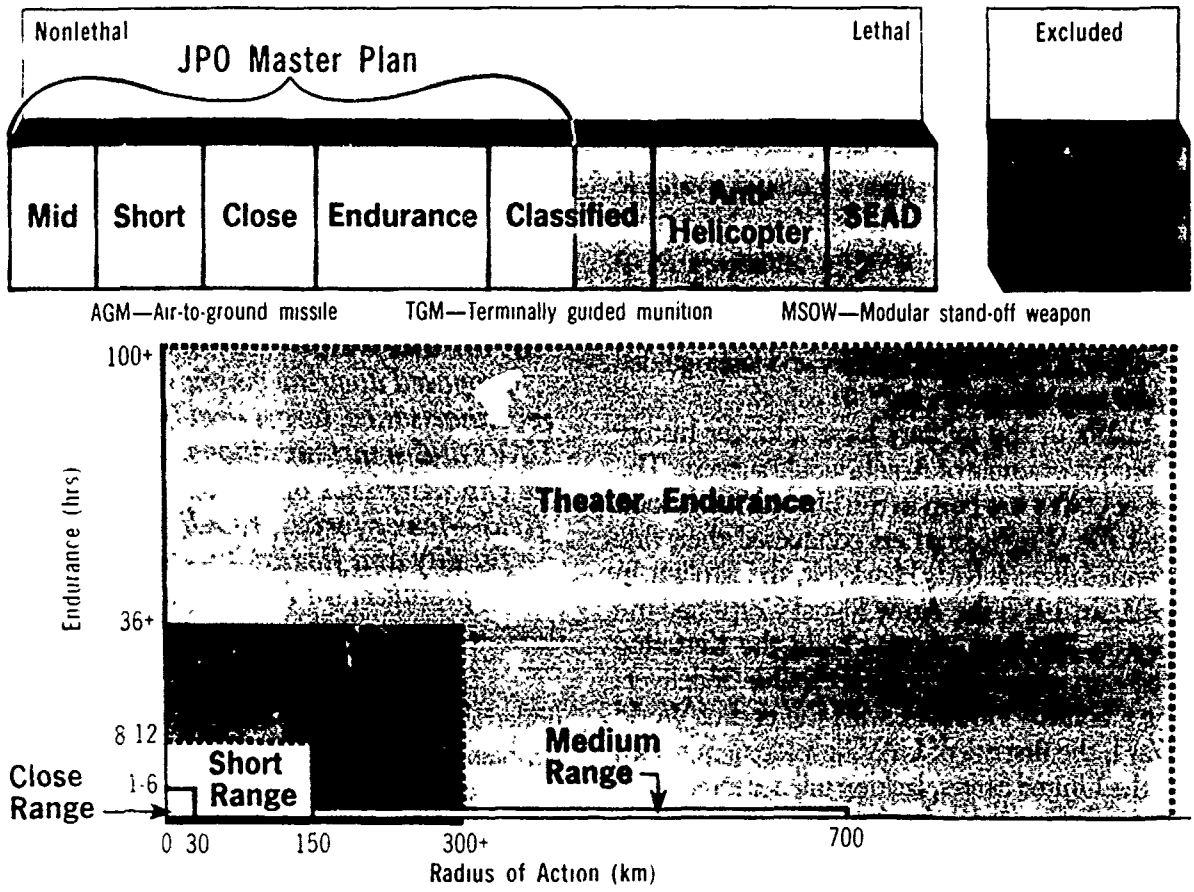


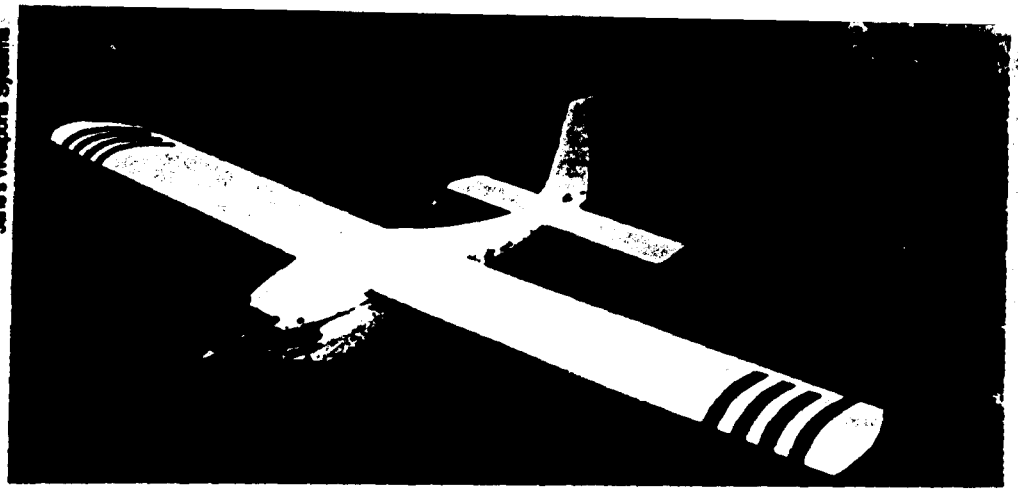
Figure 1 UAV Spectrum

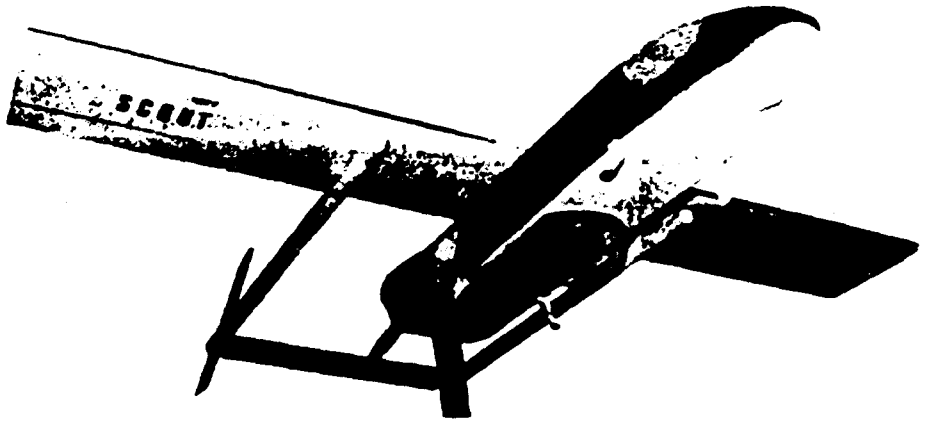
different situations. There are four principal UAV configurations that define some major system parameters: fixed-wing propeller; fixed-wing jet; rotary wing; and ducted fan. These can be lethal or nonlethal systems.

Fixed-Wing Propeller. The fixed-wing propeller system is popular because it is simple, yet effective. It can loiter for long periods of time. It can perform a variety of missions such as reconnaissance, surveillance, targeting and electronic warfare. Illustrative of this booming UAV market is the AAI Pioneer, currently deployed and in daily operational use by our Navy at sea and the Marines and Army ashore. Pioneer has 8 hours' maximum endurance, a 100-pound payload and a range of 300 nautical miles one way. Reportedly, the Sixth Fleet commander felt Pioneer had performed "flawlessly" in a recent deployment to the Mediterranean. It is also a regular component of the US Marine Remotely Piloted Vehicle Company.

Fixed-Wing Jet. Jet engines can provide speed that can be important, for instance, to increase survivability on the battlefield or to gather information quickly at long ranges. The range for these systems is no less than 300 nautical miles at medium to high subsonic speeds. The Teledyne Ryan Scarab TRAA-324 is a nonlethal turbo jet, medium-range UAV that is used by several countries as their baseline system. It has an endurance of 6 hours, a range of 1,400 nautical miles and carries a camera as its payload. It is a reconnaissance UAV, which complements manned aircraft. The lethal "Tacit Rainbow is a jet-powered, programmable, day/night long-endurance, long-range missile able to loiter and suppress radar and jammer emitters, attacking them autonomously."[5]

Rotary Wing. These systems are ideal for shipboard or restricted battlefield situation use because of their vertical takeoff capability. This class of UAVs is most often a system of counter-





Mastiff (*top*) and Scout mini-UAVs used by Israeli forces during the 1982 invasion of Lebanon. The Mastiff followed conventional miniature aircraft design and could take off and land on any piece of level ground while the Scout was launched from a truck-mounted catapult and recovered by a net at a ground station. Both UAVs were able to perform a wide variety of surveillance and reconnaissance missions and have since been significantly upgraded. The Mastiff has also been reconfigured and more closely resembles the Scout than the version flown over the Bekáa Valley.

Flying into the Bekáa Valley [in 1982], UAVs emitted electronic signals that mimicked radar signals from Israeli jets. When the Syrians activated their short-range radars in response to the perceived threat, the UAVs identified and passed on their locations and characteristic radar emissions via an E-2 Hawkeye, enabling Israeli missiles to destroy 29 SAM sites in a single hour. With the enemy air defenses crippled . . . UAVs continued to monitor for bomb damage and the movement of Syrian forces. Not a single Israeli aircraft was shot down that day.

rotating blades. The Canadair CL-227 Sentinel is one example, nicknamed "Peanut" because of its shape. It carries a selection of payloads: TV daylight or low-light-level camera, laser designator, thermal imager, radiation detector and real-time data link. Its maximum range is 31 miles and its maximum level speed is just over 80 miles per hour. It can be used for reconnaissance, battlefield surveillance or target acquisition.

Ducted Fan. Ducted fans have the advantage of low observability and could be used in urban or other restricted terrain. The Sikorsky Cypher was recently made public after four years of development under wraps. This doughnut-shaped UAV is optimized for reconnaissance roles and uses a coaxial rotor system encircled by a shroud. The shroud increases the power of the vehicle, protects it from enemy fire and sudden wind blasts.[6] If procured, it would permit the commander to spot enemy forces more than 12 miles away, allowing him to increase his situational awareness of the battlefield.

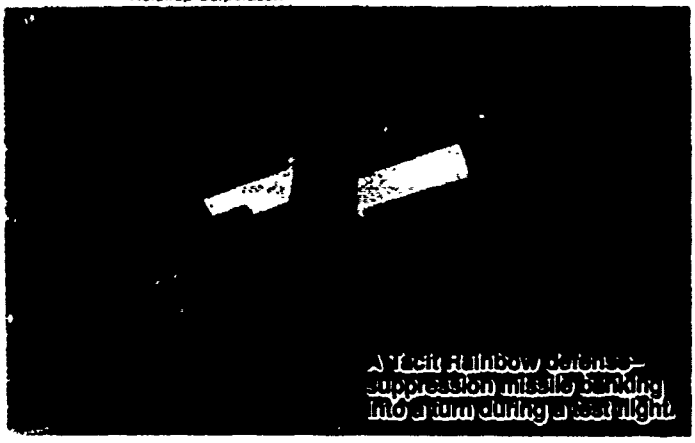
Nonlethal UAVs

In the nonlethal portion of the UAV spectrum, the Joint Program Office (UAVJPO) master plan categorizes four families of systems that have evolved to meet operational and mission capabilities required by the commander. These categories are medium (pictured as MID), short, close and endurance UAVs, corresponding to the order of their procurement (fig.1). Both lethal and nonlethal UAV systems can be used to support the nonlinear battlefield.

The UAVJPO has handled the tough challenge of melding these diverse requirements and

hardware together while trying to satisfy disparate nonlethal customers. It has weathered the first two years well, which is reflected by a $10 million increase from the $82.1 million administration request for 1991—a notable achievement in times of declining budgets. Yet, to get UAVs to the men with muddy or sandy boots in the times of dramatically decreasing budgets, proponents must overcome the same pressures that have faced these innovative systems before.

Northrup Corporation



The best example of a lethal UAV is the Tacit Rainbow emitter attack weapon, which has some missile-like capabilities with its small turbine engine. It also has a capability to fly autonomously, loiter in a predetermined area and then detect, classify and attack. In essence, this form of a lethal UAV becomes an aerial minefield, set to kill when cued properly.

The JPO recognizes that pitfalls remain. For example, the sequence of the family of systems is an important issue. To what extent should the close system be funded in parallel with the short-range system when the short-range system has not yet proved itself? Finally, commonality is a dicey problem at component, system, subsystem and end-item level. It will be easier to achieve commonality with ground stations that direct the UAVs than it will be within a single family of UAVs. For example, naval and ground close requirements are sufficiently different to make it unlikely that a single air vehicle can meet the needs of both. These are the dimensions of the problems that face the UAV community today—and this is only the beginning. Interoperability with other combat equipment will complicate the equation.

Both industry and the Army laboratories need to work together to create synergy between the sensors and platforms to give the field commander a useful weapon. Industry is constantly improving the design of sensors that can identify, enhance and locate targets. However, the platform that is capable of carrying these sensors cannot always integrate or download its data where it is most needed—to the battlefield commander. He is the one who can benefit most from the enhanced peripheral vision UAVs can provide. The process of sensor fusion is being addressed. The commander who can use these gaps in enemy lines—and protect his own—will win. This is one of the biggest challenges on the nonlinear battlefield—the fusion of intelligence assets, target acquisition and the commander's situational awareness. Clearly, UAVs will play a role here, as will the all-source analysis system at division.

The Army has used foreign comparative testing to investigate the CL-227 (Canada) and the Sprite and Raven (United Kingdom) systems. There is a significant data base from these evaluations and from prior experience with the QH-50C Dash, Aquila and the Marine Corps airborne remotely operated device.[7] The initial operational capability for the close systems was expected in FY 96. However, the Army has recently made a persuasive push to move up the Initial Operating Capability (IOC) date to FY 94 on the basis that there are already sufficiently developed systems to bring to the battlefield—at least to start dealing with the real-world doctrinal problems likely to emerge.

Lethal UAVs

Lethal UAVs are tested differently in the Department of Defense, as they are included in the conventional weapons standoff master plan and not in the UAV JPO master plan. So, although

the Tomahawk cruise missile could be considered a lethal UAV, for reasons of convenience, it normally is not. Probably the best example of a lethal UAV is the Tacit Rainbow emitter attack weapon, which has some missile–like capabilities with its small turbine engine. It also has a capability to fly autonomously, loiter in a predetermined area and then detect, classify and attack. In essence, this form of a lethal UAV becomes an aerial minefield, set to kill when cued properly.

The Army's interest lies primarily with the ground–launched version of the Tacit Rainbow (GLTR). This system is fired from the tracked multiple launch rocket system (MLRS). The GLTR will add to the MLRS' "shoot and scoot" defense against counterbattery fire and give it the capability to maintain a corridor sanitized of emitters.[8] The total program cost of the developmental GLTR program is estimated to be about $4.7 billion. Several challenging missions have been postulated for this sophisticated system.[9]

UAVs in Support of the Nonlinear Battlefield

Lethal systems are often left out of discussion of UAVs, yet they can play a crucial role in the Army's war–fighting doctrine. At the same time, as computing power gets smaller, cheaper and faster, sensors will get better and smarter. Warheads will get smaller and more lethal; airframe and engine technology will get cheaper. It is reasonable to expect that any distinctions today between the lethal UAV in the missile and weapon categories will become increasingly blurred.

The nonlethal classifications are more clear. The close–range UAV system will satisfy lower–echelon tactical units—divisions and brigades. The operational requirements for the system suggest that it be deployed at an echelon where the intelligence and targeting functions are introduced directly into existing reporting channels. In addition, there should be sufficient standoff from the battle zone to preclude posing a stationary target requiring frequent moves. In recent discussions with light infantry units, division staff members felt that lethal and nonlethal systems should be division assets, while the corps staff felt they should be corps assets! The point is that each level of command seems to want the information and killing capability that UAVs offer.

Naval and ground close requirements are sufficiently different to make it unlikely that a single air vehicle can meet the needs of both. These are the dimensions of the problems that face the UAV community today—and this is only the beginning. Interoperability with other combat equipment will complicate the equation.

The medium–range UAV is designed to complement manned strike aircraft by providing near–real–time reconnaissance data necessary for prestrike and postsrike planning. The UAV will be a high subsonic vehicle that has a moderate to high resolution imaging payload. It will have preprogrammed mission capability and navigational accuracies required to support targeting for weapon delivery. The vehicle will be ground– or air–launched and will have a 700–kilometer radius of action. This ideally suits the need to find them, fix them and in conjunction with manned strike aircraft, fight them. Clearly, this has a place in the nonlinear battlefield, providing a closed loop system in the battle zone.

The endurance UAV will generally operate within 300 kilometers of the dispersal area of a ship and have the capability for extended flight time of up to 36 hours and at altitudes above 20,000 feet. The system not only will provide a capability for wide area surveillance with single or multiple sensors (such as imagery, radio/data relay and SICINT [signal intelligence]), but also will be interoperable with the short–range UAV.

Today the Army is looking beyond parochial manned aviation interests that have so far prevented the US Air Force and US Navy from integrating UAVs into their current war–fighting doctrine. The integration of both lethal and nonlethal UAVs on the future nonlinear battlefield envisioned by US Army Training and

Doctrine Command (TRADOC) planners and doctrine writers is nonetheless a substantial challenge. As these new unmanned capabilities enter the force, it will take many bright and

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innovative minds to tailor our doctrine to make UAVs most effective in supporting tomorrow's ground commander.

In a presentation to the annual meeting of the Association for Unmanned Vehicle Systems, on 31 July 1990 in Dayton, Ohio, Major General Stephen Silvasy Jr., TRADOC deputy chief of staff for combat developments, sketched how UAVs would fit into the depth array of the nonlinear battlefield (fig. 2). The characteristics that highlight the battlefield's nonlinear quality from a UAV perspective are:

- Paucity of forces (fewer forces fielded).
- Flexibility (evolution beyond traditional branch missions).
- Rapidity of action.
- Fluidity.

Today's company commander influences much more terrain by virtue of longer range, more accurate fires and highly maneuverable weapons' platforms. Consequently, maneuver warfare does not have to be a head-to-head confrontation. Advanced systems such as UAVs can provide us the capability to strike at the enemy's weak points at opportune times and locations. Informed risk taking and offensive action are the watchwords of the day.[10]

In the parlance of the nonlinear battlefield, these are the systems that will be the commanders' scouts, enabling them to look over the next ridgeline to find and to fix the enemy. The system must be fairly simple and provide significant capability with minimum training. The close range UAV must be launched, recovered and operated with a minimum impact on deployed units. If UAVs are to be used for local area operations and deployed in large numbers, they must be affordable since they will probably encounter heavy enemy activity and the possibility of heavy vehicle losses.

The AirLand Battle Future concepts, which derive from the nonlinear battlefield, center on the role of technology, particularly sensor technology, to fill the gaps temporarily between widely dispersed forces that are interconnected with sensors of various types. Electronic sensors alone are of little value if they are not backed up by reconnaissance forces, UAVs and real-time imaging. This allows for the enemy to be attacked by fire and rapidly moving combined arms teams; subsequently, maneuver forces can be committed to fight the decisive battle. Thus,

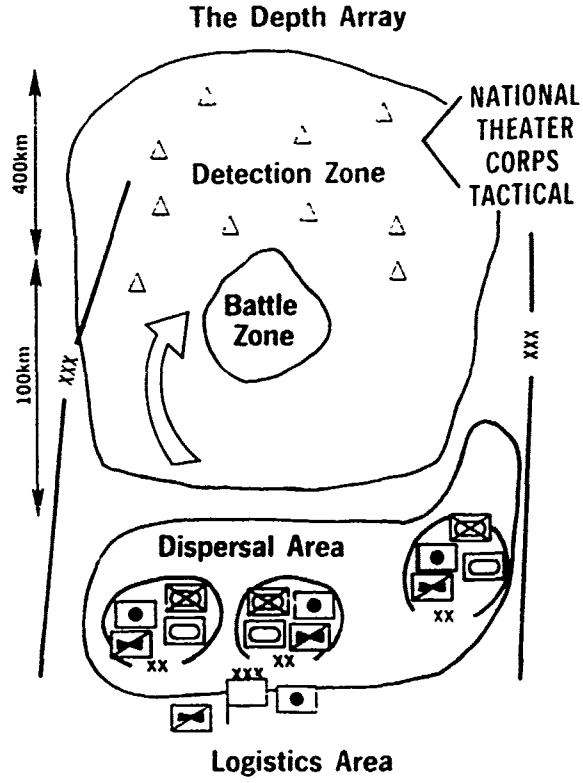

Figure 2. TRADOC's nonlinear battlefield

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as the initial defender, our deployed forces are in a position to grab the initiative and force the pace for the main body. The defender can choose the decisive engagement, using UAVs and recon units to develop the situation for the main fight. In trying to characterize the nonlinear battlefield cycle and the tempo it dictates in this article, we have borrowed heavily from TRADOC's work, but the following interpretation is ours alone.

Find 'em. In the detection zone, out to 500 kilometers forward of the corps dispersal area, the corps commander would begin to use national, theater, corps, Guardrail (airborne radar system) and Joint Surveillance and Target Attack Radar System (JSTARS) assets to find the enemy. Endurance UAV systems would be key here, and it is useful to think of them as low-flying satellites. Therefore, the commander on the ground may not be the direct beneficiary of these systems. They will likely pass through corps and national technical means that have at least a three-day window on the enemy.

Since exact mobile radar locations will be tough to track continuously, two options are air- or ground-launched Tacit Rainbow systems or another, slower suppression of enemy air defenses (SEAD) weapon like the Israeli Harpy, a lethal UAV that is capable of long loiter and autonomous firing. Speed plays a role because it translates, through fuel usage, to range. Range is important because the INF (intermediate-range nuclear forces) Treaty between the United States and Soviet Union effectively limits the range of ground-launched weapons to 500 kilometers. Open sources indicate that the Israeli Harpy has a propeller engine, which gives it substantial endurance as it cruises to the target area looking for radars and increased persistence when acting like an aerial minefield.[11] The fast and slow approach to SEAD may be complementary on the nonlinear battlefield.

Shortly after the hostilities, sources in US Southern Command stated that "Soldiers' lives

were compromised during the recent *Just Cause* operation in Panama due to the lack of Unmanned Aerial Vehicles."[12] Use of short-range systems could have improved the situation. For example, short-range requirements call for a system that can reconnoiter 150 to 300 kilometers forward of the dispersal area. This vehicle will conduct missions at low altitudes and transmit data to a ground control station within line of site or via an airborne relay if the vehicle is below the horizon. The short-range system vehicles may be configured to carry mission specific payloads or have unique survivability characteristics. In addition, it is to be the common architecture to achieve interoperability of all categories.[13] Such UAVs would have enhanced US forces reconnaissance, targeting and attack capabilities. Now, two contractors have been selected to compete for a short-range 1991 flyoff and production decision.

Today's company commander influences much more terrain by virtue of longer range, more accurate fires and highly maneuverable weapons' platforms. Consequently, maneuver warfare does not have to be a head-to-head confrontation. Advanced systems such as UAVs can provide us the capability to strike at the enemy's weak points at opportune times and locations. Informed risk taking and offensive action are the watchwords of the day.

Fix 'em. On the future battlefield, the UAV can fix the enemy by keeping him from moving, communicating or interrupting the movement of combat formations. As a precursor attack, autonomous, lethal UAVs can attack enemy air defenses and crucial enemy communication nodes and command posts. Lethal UAVs being considered as sensor technologies are being paired with both fast jet turbines and slow propeller UAVs that can fix the enemy. For example, a UAV that marries the Army's developmental infrared terminally guided sub munition (IRTGSM) with a loitering, lethal UAV might be useful to fix and destroy helicopters, tanks, command vehicles and other selected targets without attacking the main body. The close-range UAV will maximize the brigade commander's killing power.

At the 100-kilometer area, the commander must fix the enemy, interrupting his opponent's march table and forcing him to deploy. Reconnaissance UAVs and air and ground cavalry all contribute to this function. There are a variety of missions: target acquisition, designation, battle damage assessment (BDA), electronic warfare, command and control, decoy and meteorological/nuclear, biological and chemical deployment. The medium UAV will complement the manned aircraft and, as such, help it decisively engage in the main battle area. Its imaging payload provides a closed loop on real-time engagements, adding to the success on the nonlinear battlefield. The importance of the closed loop system is the identification of targets before engagement, followed by an assessment of target kill after engagement. This ensures minimum ammunition expenditure.

Fight 'em. Within 100 kilometers of the dispersal area, enemy maneuver units are dispersed and moving. This makes it difficult to target enemy formations. Close air support and battlefield air interdiction are primary means of aerial fire support. In addition, aerial mines of lethal drones can be effective against the enemy. The longer the loiter time, the more effective lethal UAVs can be because it will take time to locate the targets.

Then, corps-controlled long-range fire support, aviation and attack helicopters can be committed to the battle zone assisted by the short-range UAV. Finally, division-controlled maneuver forces and supporting fires are brought to bear in the battle zone, again using the targeting data from the UAVs. This cycle can repeat itself. The concept is to keep the enemy responding to our tempo. By using UAVs to monitor the progress of the battle and to de-

termine the lethality of long–range fires, focused reattacks may be particularly effective. In any case, unmanned aviation should be the system of choice to conduct BDA for two reasons: first, it is hard to imagine a tougher task than to observe an enemy that has just been stirred up by an attack; second, the UAV will be under the direct operational control of the corps, division and brigade commanders who can ensure they get the information they need, when they need it.

Refit. To avoid counterattack and to return to the dispersal area for logistical support, units disperse and reconstitute. Reconnaissance UAVs are recovered and subsequent flights are used to monitor the enemy's reaction and to assess the optimum time for the next attack. The UAV would help the friendly commander reconstitute his own forces by observation of their movement and strengths.

The challenge for UAVs lies as much on the conceptual side as it does on the technical—in fact, perhaps more so. In general, many of the technical challenges appear to be within reach in the next decade or so. Later refinements will likely take the UAV along the same path followed by its more mature, manned aviation cousin over the last 70 years.

By using UAVs to monitor the progress of the battle and to determine the lethality of long–range fires, focused reattacks may be particularly effective. . . [Unmanned aviation] will be under the direct operational control of the corps, division and brigade commanders who can ensure they get the information they need, when they need it.

In the area of doctrine, however, it is not obvious how clever tacticians will be in the use of this revitalized information and killing tool. History has already shown that it has only been the imperative of combat that has forced commanders to turn to innovative technology like unmanned systems. The new and challenging nonlinear battlefield concept may be the first ground and air doctrine developed in peacetime to demand the unmanned system be used to its maximum potential. It only awaits bright US Army minds to lead the unmanned charge. ***MR***

NOTES

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3. *Lightning Bugs and Other Reconnaissance Drones* (Fallbrook, CA: William Wagner Aero Publishers, Inc., 1982), 86.
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6. Caleb Baker, "Sikorsky Enters UAV Market With Circular Drone," *Defense News (28 May 1990), 10*
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13. Ibid., 2.

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Operation CRUSADER

Preview of the Nonlinear Battlefield

Major John Gordon IV, US Army

The term "nonlinear battlefield" has become the centerpiece of our Army's doctrinal development efforts. AirLand Battle Future will place great emphasis on capabilities suited for that environment. While the term may have only recently gained prominence, the author describes a World War II battle, the British Operation* Crusader, *which depicts many of the features and offers several lessons from an intense fight on a mostly nonlinear battlefield.

AS THE 1990s begin, the US Army is molding itself for the future. Weapons, organization, training and doctrine are all areas that will see fundamental change in the years ahead. The Army will welcome some changes and will, in fact, introduce some on its own; others will be painful and be forced upon the service. The challenge of operating on a reduced budget while striving to maintain a quality force (that is versatile, deployable and lethal) will drive the Army to modify its force structure and doctrine. It is in the area of doctrine that the Army has a very large degree of control over its own destiny.

As the challenging and turbulent 1990s begin, the Army is considering a major change in its doctrine. One major concept being seriously considered is the notion of nonlinear warfare. With fewer forces available in the future, at least in the initial phases of a conflict, the Army will likely have no choice but to be prepared to fight in a highly mobile, nonlinear manner. At the tactical and operational levels, the possibilities of nonlinear warfare offer great opportunities and challenges. It is likely that the Army will determine that a nonlinear doctrine will be applicable at all levels of conflict. Unfortunately, the concept is still poorly understood, and the US Army has little practical experience in mid- to high-intensity nonlinear combat.

There are numerous historical examples of tactical- and operational-level combat that provide marvelous insights into nonlinear combat. Particularly useful are the World War II actions in North Africa. One such operation

viewed here because it is a classic example of a nonlinear fight. The study of this and similar battles should give today's Army much food for thought as it retools for the future.

In November 1941, a tremendous battle occurred in eastern Libya between the British Eighth Army and the German/Italian *Panzergruppe Afrika*. Usually known by its British title, Operation *Crusader*, this three-week operation was a multicorps, high-intensity fight between two armies that were nearly equal in manpower. The battle occurred in an area roughly 100 miles by 50 miles. While there were portions of the battlefield that would be considered linear, the majority of the action was totally without a front line at any echelon above brigade level.

The Situation

From April through November, the British garrison in the vital port of Tobruk had been encircled by Axis forces under General Erwin Rommel. After two failed attempts to storm the Tobruk perimeter, Rommel adopted a siege posture to build up strength for another assault. By mid-November, he was nearly ready for a much more powerful attack to take the port.[1]

While Rommel had Tobruk surrounded, the main British force, the Eighth Army, had been building up its strength in Egypt. Two British offensives against Axis forces along the Libyan-Egyptian frontier had failed; the last had occurred in June. Following that, Eighth Army settled back to gain strength for a full-scale offensive to relieve the Tobruk garrison and destroy *Panzergruppe Afrika*.[2] Thus, as mid-November arrived, both sides were planning major offensive operations. It was the British who struck first. The forces arrayed for *Crusader* are summarized below:[3]

Axis:

Approximately 119,000 German and Italian troops

Panzergruppe Afrika (General Rommel)

Deutsches Afrika Korps (DAK)
(General Ludwig Crüwell)

15th Panzer Division—133 tanks
21st Panzer Division—111 tanks
90 Light (*Afrika*) Division
Savona Infantry Division (Italian)

21st Italian Corps (General Navarrini)

Brescia Infantry Division
Bologna Infantry Division
Trento Infantry Division
Pavia Infantry Division

20th Italian Mobile Corps (General Gambara)

20th Corps was not under Rommel's direct command.

Ariete Armored Division —146 tanks
Trieste Motorized Division

This does not include tanks armed with machineguns. There were virtually no German or Italian tanks in reserve. A few extra vehicles were in workshops undergoing repair.

British:

Approximately 118,000 British, New Zealand, Indian, Polish and South African troops.

Eighth Army (General Alan Cunningham)

13th Corps (LtGen Godwin-Austen)

New Zealand Infantry Division
4th Indian Infantry Division
1st Army Tank Brigade—135 tanks

30th Corps (LtGen Norrie)

7th Armored Division—469 tanks
1st South African Infantry Division
22d Guards Motorized Infantry Brigade

Tobruk Garrison (Major Gen Scobie)

70th Infantry Division
Polish Carpathian Infantry Brigade
32d Army Tank Brigade—126 Tanks

Eighth Army held an additional 260 tanks in reserve or in workshops in Egypt to feed forward as replacements for battle losses.

The Axis had 342 serviceable aircraft in eastern Libya while the British had at least 550 serviceable aircraft in Egypt with over 200 more in reserve. Additional aircraft were available to both sides from bases in the Mediterranean.[4]

The British formations were generally up to strength in men and equipment. The Axis units were somewhat understrength, primarily due to the effects of months of British air and naval interdiction against their supply lines from mainland Italy. In October, the British sank a total of

The Eighth Army's great weakness, little appreciated before the battle, was a tactical doctrine that did not stress combined arms formations at battalion/brigade level and the terrible tendency of divisional and corps commanders to split their forces against multiple objectives rather than concentrating decisive strength against a critical point.

63 percent of all Axis tonnage destined for North Africa. These losses caused Rommel to postpone his attack on Tobruk until late November.[5]

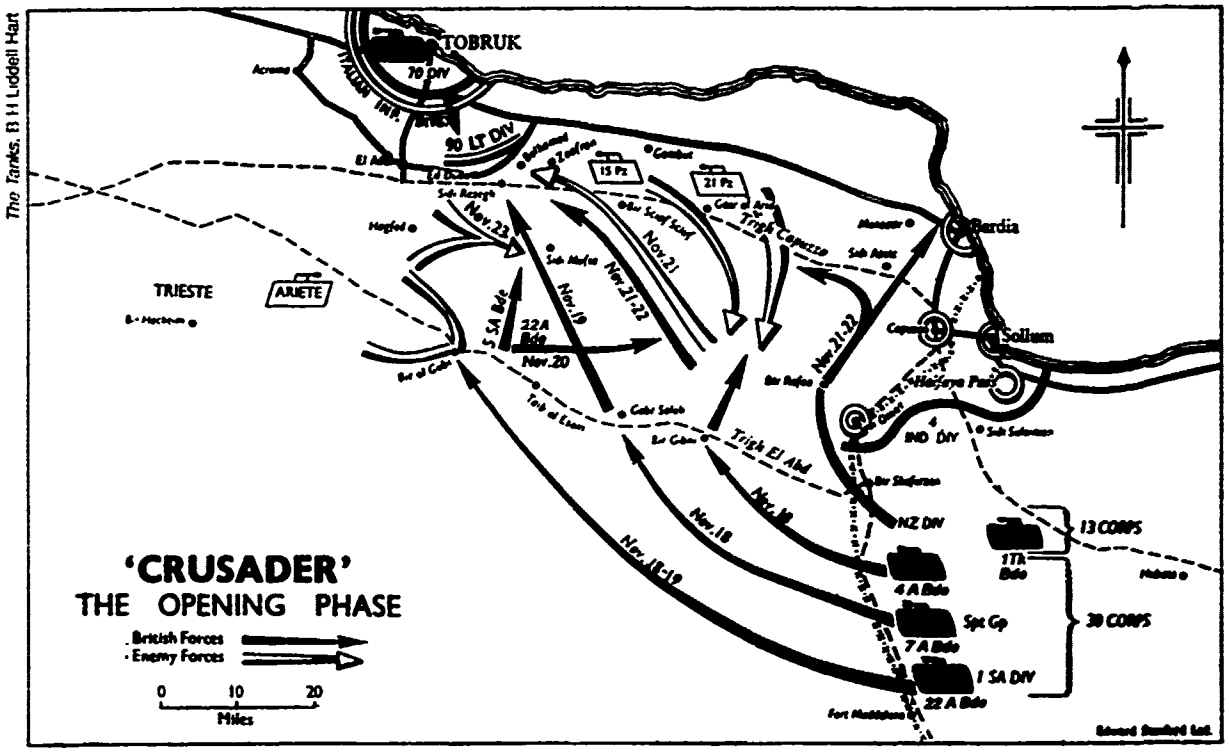
The Italian infantry divisions were, generally, foot-mobile. Additionally, Italian divisions were small, having only two regiments as opposed to three brigades in British divisions. The 15th and 21st Panzer divisions, the heart of *DAK*, were probably the smallest panzer divisions in the entire *Wehrmacht*. Each had one panzer regiment, but only one motorized infantry regiment rather than the two normally found in a panzer division.[6]

Rommel had positioned the rather immobile Italian 21st Corps around Tobruk to maintain the siege. This was to be a rather traditional, linear sector of the battle area. East and southeast of the siege lines was *DAK*, readying itself for the attack upon Tobruk, but also prepared to move against any British push from Egypt. The Italian 20th Mobile Corps was south and southwest of Tobruk. Manning the Egyptain-Libyan frontier, in fortified positions running roughly 25 miles inland from the sea, was the Italian Savona Division, heavily reinforced by German infantry and several deadly 88mm, dual-purpose Flack guns. Like the siege lines around Tobruk, the frontier fortified area represented a linear front. The attention of the *panzergruppe* staff was on the upcoming Tobruk attack.[7]

The Eighth Army was planning to encircle and destroy the Savona Division near the coast with the infantry-heavy 13th Corps. Meanwhile, the decisive move would be 30th Corps sweeping south around the flank of the Axis frontier garrisons to move toward Tobruk. It was expected that somewhere southeast of Tobruk a decisive tank battle would erupt. Since it was clear Rommel would fight to prevent the siege being lifted, *DAK* would have to intervene. Once *DAK* was defeated, the Tobruk garrison would burst through the Italian 21st Corps and link up with the approaching British armor. The final stage of the battle would be mopping up and pursuit westward. The Eighth Army's main thrust into the open area southeast of Tobruk ensured that the major engagements would take on a nonlinear flavor; neither side had sufficient forces to create a solid linear front in such a large area that favored maneuver.[8]

It can be seen that Eighth Army had a potentially decisive edge in tank and air strength, even though in overall manpower the two sides were near parity. The Eighth Army's great weakness, little appreciated before the battle, was a tactical doctrine that did not stress combined arms formations at battalion/brigade level and the terrible tendency of divisional and corps commanders to split their forces against multiple objectives rather than concentrating decisive strength against a critical point.

The area into which this great battle was about to erupt was generally favorable to movement of large military formations. Running parallel to the coast, and normally several miles inland, were several escarpment ridges that limited north-south movement to those places where roads passed through the terrain feature. The desert roads that crisscrossed the area facilitated navigation and eased movement somewhat, but formations of any size could move through the desert off of the roads. The only substantial fortifications in the area were the Savona Division's



This map shows the opening of the British offensive up to the intense fighting near the Sidi Rezegh airfield south of Tobruk. The Italian Savona Division, plus some Germans, were in the defensive positions near the Egyptian frontier. The German 90th Light Division shown south of Tobruk was originally known as the *Afrika* Division and, today, the British 4th and 7th Armored Brigades are serving in the Saudi Arabian desert.

positions along the frontier, the perimeter of the port of Bardia and the siege lines around Tobruk. For the most part, the battlefield was a huge open area, ideal for the maneuver that occurred.

The Battle

The battle as it unfolded can be described in four phases, highlighting its important features. Almost immediately, the battle began to take on an extremely nonlinear form.

Phase I (1–17 November). During early November, the Eighth Army readied itself for the attack. The majority of its forces remained well to the east of the Libyan–Egyptian frontier so as to reduce German suspicions that an offensive was about to begin. It was only in the last few days before the attack that large movement toward the operation's starting positions took place, usually under cover of darkness. The Desert Air Force intensified its counterreconnaissance efforts, and radio usage was restricted. By the night of 17 November, the Eighth Army was in position to attack. On the Axis side, the Italians were becoming increasingly aware that a British offensive was close at hand. Rommel was pressured to abandon his planned attack on Tobruk and to prepare to meet a British offensive from Egypt. Rommel deliberately ordered his staff to downplay the prospects of a British attack, despite the fact that air reconnaissance and radio intercepts in early November did point to a British build-up in Egypt.[9]

On 16 November, as the Eighth Army was moving into its attack positions, the Axis airfields were inundated by a terrific rainstorm that left their aircraft grounded for several days.[10] Thus, the adverse weather deprived the panzergruppe staff of a vital intelligence collection means at a critical moment. By 17 November, the *panzergruppe* intelligence staff had noted that Eighth Army was under radio silence. Something was clearly about to happen. Reluctantly, Rommel removed 21st Panzer Divison from the planned attack on Tobruk, now just days off, and ordered it to prepare to intercept any British move across the desert.[11] The 15th Panzer was

Imperial War Museum

Italian trucks wrecked by British aircraft near Bardia and (above) a Royal Air Force Hurricane strafing Axis [illegible]

still on call for the Tobruk assault. South and southwest of the Savona Division's frontier fortifications were German reconnaissance battalions spread in the desert to watch the open flank. The stage was now set.

Phase II (18–23 November). Before dawn on 18 November, thousands of British vehicles moved west across the frontier. Almost at once, the battle became nonlinear. Except near the coast, where New Zealand and Indian infantry moved to pin the Savona Division, the battle began with brigade-size formations, subdivided into battalion "columns," flowing into the desert. Normally, there were many miles between brigades. The XXth Corps moved out with three armored brigades in the lead, sweeping well to the south of the Axis frontier fortifications. Only German reconnaissance units, which fell back, barred their way. Many miles were covered that day, but the British desired engagement with German armor did not occur.

Somewhat puzzled by the lack of enemy reaction, Brigadier General W.H.E. Gott, commander of the 7th Armored Division, issued fateful orders for the next day. The powerful 7th Armored Division, now well inside Libya, would split into brigades and go after multiple objectives. The 22d Armored Brigade would move west to attack the Italian Ariete Division near Bir el Gubi; 7th Armored Brigade and the divisional support group would advance northwest to the Sidi Rezegh airfield near Tobruk; and the 4th Ar-

mored Brigade would hang back to act as a link between 7th Armored Division and the rest of 13 Corps.[12] Thus, the most powerful British formation (when massed it had more tanks than the entire *panzergruppe*) was scattered. As this was occurring, *DAK* received its marching orders.

Although caught off guard by the British move, Rommel ordered *DAK* to move south in the general direction of the British armor. The Germans were still unsure of the location of the major British units and as to what the British objectives were. However, the different tactical philosophies of the opposing commanders were already becoming clear. As the British were scattering their armor, Rommel was moving to concentrate his. This was to prove a key to the many German tactical successes during *Crusader*. Although the battle was highly nonlinear, the Germans deliberately concentrated their most powerful elements—the panzer regiments of the two panzer divisions—and moved them around the battlefield to the critical points to achieve decisive effect.

Several minor engagements were fought where the British 4th Armored Brigade was bested, but not decisively beaten. Both sides were still feeling each other out. The fact that there was no front line, as brigade-size units moved about in the open desert, contributed to the confusion. The catalyst occurred when the British 7th Armored Brigade overran Sidi Rezegh airfield only 20 miles from Tobruk.

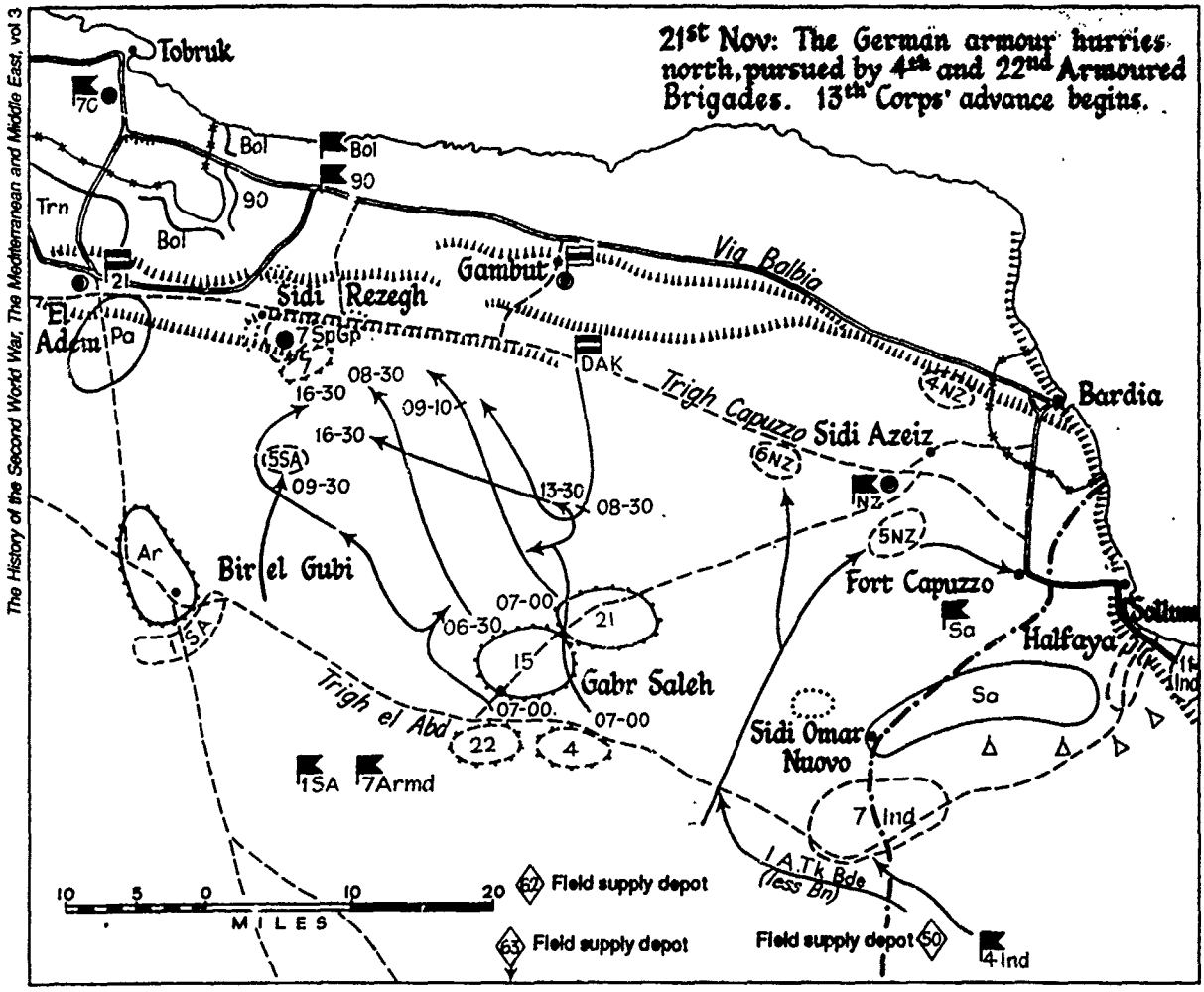
Realizing he had British armor almost directly behind the Italian infantry besieging Tobruk, Rommel ordered both panzer divisions to concentrate at Sidi Rezegh. On 21 November, the urgency of the situation was greatly magnified as the British 70th Division (inside the Tobruk perimeter) began to attack toward Sidi Rezegh. The German infantry on the escarpment overlooking the Sidi Rezegh airfield could barely contain the British armor that was advancing north toward the Tobruk perimeter.

On 22 November, a massive, swirling battle unfolded, surrounding the Sidi Rezegh airfield. Both panzer divisions arrived and attacked elements of the 7th Armored Division that were holding the airfield. The single British armored brigade on hand, the 7th, suffered heavily. The 4th and 22d Armored brigades tried to enter the fight from the south, but were delayed by rear guards from the two panzer divisions. The 22d Armored Brigade had earlier been weakened by being repulsed at Bir el Gubi by the Italian *Ariete* Division—yet another result of the dispersal of British armor. By late afternoon, an incredible situation had developed.

As the British were scattering their armor, Rommel was moving to concentrate his. This was to prove a key to the many German tactical successes during* Crusader. *Although the battle was highly nonlinear, the Germans deliberately concentrated their most powerful elements—the panzer regiments of the two panzer divisions—and moved them around the battlefield to the critical points to achieve decisive effect.

Sandwiched into the area from the Tobruk perimeter to a point several miles south of Sidi Rezegh were:

- The British 70th Division fighting to break out of the perimeter in the direction of the airfield.
- Germans from the *Afrika* Division and Italians from the Bologna Division, facing north trying to stop them.
- More Germans from the *Afrika* Division holding the escarpment above the airfield, facing south against the British 7th Armored Brigade and 7th Support Group.
- The above-mentioned elements of the 7th Armored Division, fighting north against the escarpment and south against the main elements of 15th and 21st Panzer divisions, which were advancing toward the airfield from the south, who were, in turn, being pursued by the 4th and 22d Armored brigades that were desperately trying to link up with their hard-pressed



The map above shows how the sandwiching effect developed near Sidi Rezegh. Meanwhile, the New Zealand Division by-passed the Italian Savona Division at the frontier and moved toward the coast road between Axis positions at Bardia and Gambut as other fighting continued on the eastern and western extremes of the battlefield.

comrades at Sidi Rezegh airfield.

All this was taking place in an area roughly 20 miles by 20 miles (see map). In the words of the British Official History, "A complicated situation indeed, which, if suggested as the setting of a training exercise, must have been rejected for the reason that in real life these things simply could not happen. [13]

On 23 November, this remarkable engagement continued, with hardly anything resembling a front line. The tactical prowess and flexibility of the two panzer divisions were demonstrated in their ability to wage a battle in two directions simultaneously. While their main elements, the panzer regiments, attacked the 7th Armored Brigade and the support group at the airfield, antitank units held off the 4th and 22d Armored brigades that were attempting to advance into the rear of the panzers. By late afternoon, *DAK* had reduced the 7th Armored Brigade to 10 running tanks and the 22d Armored Brigade to 34. As the battered British armor was forced back, the 5th South African Infantry Brigade, lingering much too close to such a monumental armored clash, found itself surrounded by approximately 170 remaining tanks of the *Afrika Korps*.

At 1500, General Crüwell, *DAK*'s commander, launched virtually everything he had in an *Afrika Korps*' version of a mechanized banzai

charge against the besieged South Africans. Despite desperate resistance, the South African brigade was overrun and wiped out.[14] Remnants of British armor attempted to come to the rescue of the South Africans, but once again the panzer divisions showed great ability in waging fights in multiple directions simultaneously. The German antitank screens held firm as the panzer regiments overran the South Africans.

With the British armor now a fraction of its former strength and the 70th Division's push temporarily stopped, it appeared that *panzergruppe* had won the battle. Alas, Rommel, the wily "Desert Fox" himself, now pulled defeat out of the jaws of victory.

Phase III (24 Nov.–3 Dec.). What occured next is an excellent example of the difficulty of properly judging what is happening in a confusing nonlinear battle, even for a commander as battlewise and astute as Rommel. Essentially, Rommel misjudged the situation and felt it was time for a general pursuit of the British to the Egyptian frontier, and possibly beyond. Against the urging of Crüwell and the *panzergruppe* staff, Rommel decided to take the surviving German armor away from Sidi Rezegh and drive to the frontier.[15]

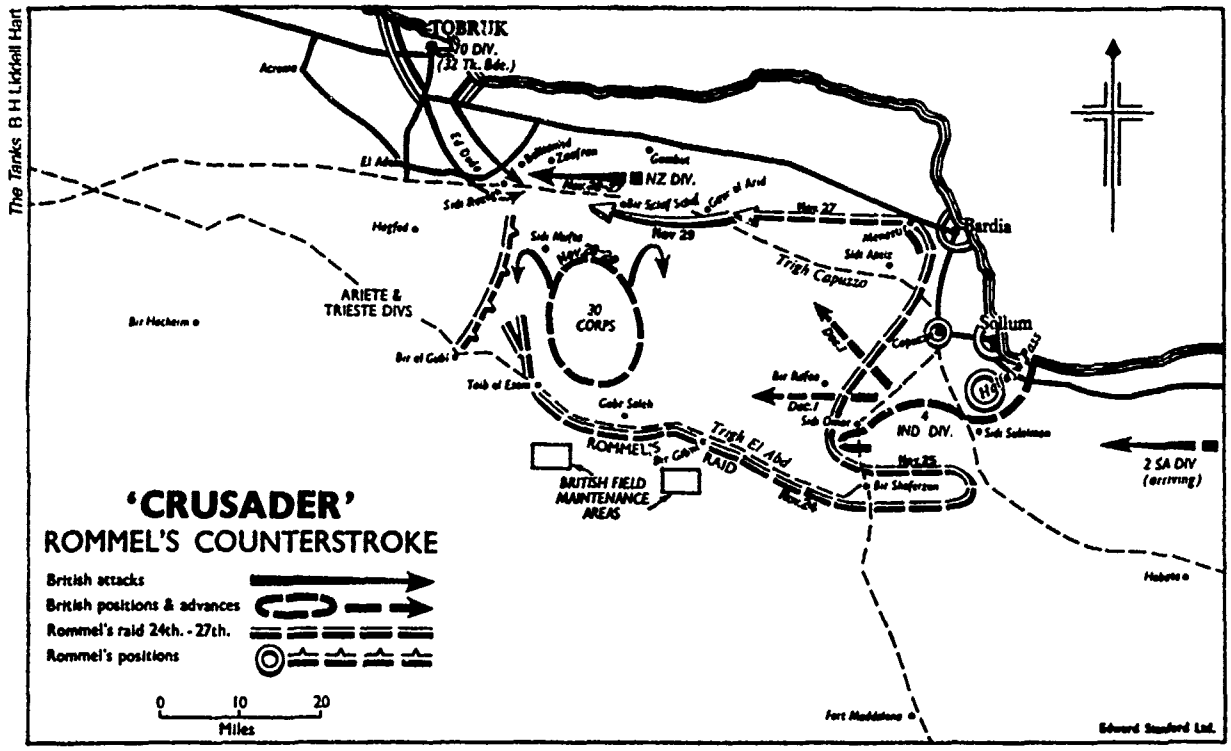
There were several reasons for this decision. First, the Savona Division was now virtually encircled and very hard-pressed. Additionally, Rommel felt that heavy losses suffered by the British 7th Armored Division had eliminated it as a viable force. This seemed to present the opportunity to hurl the British back into Egypt.[16]

Crüwell, on the other hand, pressed for a continuation of the battle near Sidi Rezegh to finish off the 7th Armored Division. Certainly, the British armor had been dealt a heavy blow, but there were few prisoners from the armored units, indicating that they could refit if given breathing space. The rest of the 1st South African Division was also in the area south of Sidi Rezegh. Cruwell thought it better to finish them off and then refit the tired panzer battalions before driving to the aid of the Savona Division. He knew that *DAK* had suffered heavy tank losses in the fighting around Sidi Rezegh. Indeed, there were now only 70 to 80 operational German tanks, with others being hauled into workshops. Neither Rommel nor Crüwell were aware that the losses had been that severe. There was a need to mop up and regroup in place.

In [the] confusing nonlinear battle . . . Rommel misjudged the situation and felt it was time for a general pursuit of the British to the Egyptian frontier, and possibly beyond. Against the urging of Crüwell and the* panzergruppe *staff, Rommel decided to take the surviving German armor away from Sidi Rezegh and drive to the frontier. . . [because he] felt that heavy losses suffered by the British 7th Armored Division had eliminated it as a viable force.

Nevertheless, on the morning of 24 November, with Rommel personally in the lead, *DAK* roared east in what became known as "Rommel's dash to the wire" (referring to the thick belt of barbed wire the Italians had placed along the frontier before the war). Dash it certainly was; DAK covered 60 miles in roughly 6 hours. There were no "flanks," as major German units raced east even as British units to the north and south of them continued to push toward the Tobruk perimeter. As it advanced, masses of British supply vehicles, plying to and from the forward units to Egyptian supply dumps, were scattered to the four winds. Some were overrun and shot up, others raced to get out of the way of the two advancing panzer divisions. Despite this exciting beginning, the "dash to the wire" soon fizzled.[17]

Upon reaching the vicinity of the frontier on 25 November, the two weakened panzer units wasted much of their effort hurling themselves against prepared artillery positions of the 4th Indian Division. The 5th Panzer Regiment, for example, lost 18 of its 45 remaining tanks trying to charge the 1st Field Regiment which used its 25-pounder field gun to good effect against the German tanks.[18] Some relief was given to the



This map shows Rommel's "Dash to the Wire" following his victory over the British 7th Armored Division and the 5th South African Brigade near Sidi Rezegh. Note how the New Zealand Division was near the coast as Rommel was dashing eastward. The New Zealand Division continued its advance toward Tobruk, even though the *DAK* was, technically, in its rear once Rommel took his force to the frontier. Also, note that as Rommel attacked east, there were substantial elements of 30th Corps that remained in the area near Sidi Rezegh. This is an excellent example of the nonlinear nature of *Crusader*.

embattled Savona Division, but for the frontier garrisons, the brief visit by the two panzer divisions was to prove a Pyrrhic victory. The German panzer units, having raced for the frontier before their supply system back near Tobruk could prepare, "raided" the supplies of the frontier units. In any case, the 4th Indian Division dug in and weathered the storm, which did not last long. By 27 November, both panzer divisions had to pull out and head back toward Tobruk where a new crisis had erupted.

While *DAK* was bouncing off British artillery positions near the frontier, the New Zealand Division had been advancing along the coast road after bypassing the Savona Division. That such an event was occurring well behind *DAK*'s position along the frontier is another indication of the highly nonlinear nature of this battle. Technically, *DAK* had the New Zealanders "cut off" to their northwest. However, since the battlefield was so "porous" and nonlinear, the New Zealanders were able to maintain their supply lines across the open desert and continue to advance even though the two panzer divisions seemed to have moved into their rear.

As the New Zealanders were advancing, the Tobruk garrison had renewed its attempt to break out. Ominously, the predictions of Crüwell began to unfold as the battered British armored units, now well south of Sidi Rezegh and also behind *DAK*, received new tanks brought forward from Egypt. It should be noted that the British armor had been able to refit even when *DAK* was lunging for its supply routes near the frontier. By routing vehicles and supply convoys south of *DAK*'s advance, the British managed to keep the lines of communications open to its battered, but recovering, armor. This battle was so nonlinear that by late afternoon, huge supply convoys might be moving through an area that had witnessed a massive armor clash in the early morning. [19]

Imperial War Museum

(*Left*) A British cruiser tank hit during an engagement in the Sollum–Halfaya area during *Crusader* and (*below*) a dug-in 88mm flak gun captured near the coast road

Notice must be given here to the brave decision of the British Middle East commander in chief, General Sir Claude Auchinleck. As *DAK* was surging toward the frontier wire on 24–25 November, there was a virtual panic in Eighth Army Headquarters. That this armored onslaught could be coming immediately after the pounding of British armor near Sidi Rezegh was too much for Eighth Army's commander, General Cunningham. Cunningham advocated that the battle be terminated and a general withdrawal back into Egypt take place. Auchinleck would have none of it, and insisted that the battle continue. In fact, Auchinleck relieved Cunningham and replaced him with Major General Neil Ritchie. Given the events of the past few days, the decision to continue the battle required great courage.

Auchinleck correctly read the tell-tale signs and realized that he had some important advantages. The New Zealanders were approaching Tobruk, the Indians had a firm grip on the frontier area; and although his armor had been defeated, it had not been destroyed. Hundreds of reserve tanks were available, and if they could be pumped forward around the open southern flank to the tank units desperately awaiting them, there was hope that the 7th Armored Division could be rebuilt in the field. (7th Armored Brigade had been pulled back to Egypt to refit.)[20]

By 29 November, a greatly weakened *DAK* was engaged in a furious battle near Tobruk with

Rommel made the decision to break off the battle and pull out to the west before supplies, particularly fuel, were totally consumed and before British armor could get astride the lines of retreat. The foot-mobile Italians would have to pull out first, with DAK and the weakened 20th Mobile Corps covering their withdrawal. Nearly 15,000 [Axis] troops along the frontier would have to be abandoned.

the New Zealand Division. *Ariete* joined the fight and the New Zealanders began to suffer heavily. Nevertheless, British armor now began to show signs of recovery and started to attack the German and Italian units that were protecting *DAK*'s rear near Sidi Rezegh. Meanwhile, 4th Indian Division tightened its grip on the Savona Division at the frontier. *Crusader*, despite its highly fluid, nonlinear nature, was becoming a test of endurance. With virtually no reserve tanks to draw on, *DAK*—the critical element in *panzergruppe*—was being worn down. Auchinleck's decision to fight was paying off.

Phase IV (3–25 December). On the evening of 3 December, Rommel was faced with a desperate decision. On the surface, it seemed that the Axis forces had done well. The New Zealand Division had finally been stopped, and the siege of Tobruk maintained. However, the overall situation had become critical. Due to the never ending British aerial pounding of the port of Benghazi (the Eighth Army's deep battle), supplies were now desperately short. *DAK* had a total of roughly 60 operational tanks remaining, and the Italian formations had been exposed to the assaults of the Tobruk garrison and were just about at the end of their rope. Additionally, the now revived British armor south of Tobruk was trying to get behind panzergruppe and astride Rommel's supply line which led to Benghazi. Air reconnaissance had detected the arrival of the fresh 2d South African Division in the battle area.

Rommel made the decision to break off the battle and pull out to the west before supplies, particularly fuel, were totally consumed and before British armor could get astride the lines of retreat.[21] The foot-mobile Italians would have to pull out first, with DAK and the weakened 20th Mobile Corps covering their withdrawal. Nearly 15,000 German and Italian troops along the frontier would have to be abandoned to their fate.

By the morning of 10 December, *Crusader* had for all intents and purposes come to an end. *Panzergruppe Afrika* began to withdraw to the west, with the motorized elements holding off the British as the foot-mobile German and Italian elements hurried along the coast road. A large amount of heavy equipment had to be abandoned due to lack of transport. By 25 December, *panzergruppe* was all the way back at El-Agheila, where Rommel had started his spectacular advance in March 1941. The Axis frontier garrisons held out until 17 January 1942, when 13,800 Axis prisoners were taken there by the British.[22] *Crusader* had been a British victory, but at great cost. The British lost roughly 600 tanks versus 340 Axis vehicles. British personnel losses amounted to 17,700.[23]

Meaning of the Battle

Crusader was a battle fought at a furious pace over a very large area. Despite the fact that it occurred 50 years ago, *Crusader* offers many insights into high-intensity, nonlinear combat at the tactical and operational levels.

Both sides lacked sufficient forces to adopt a linear posture over such a large area (over 5,000 square miles). They were forced into a predominantly nonlinear configuration, while there were certain areas of the battlefield, particularly the siege lines surrounding Tobruk, where combat was linear from start to finish.

The key to success at the tactical level was concentration of effort at the decisive time and place and a recognition that the enemy force was the main objective.

Despite the fact that *DAK* was badly outnumbered by British armor, the Germans won engagement after engagement. This was primarily due to their deliberate attempt to keep *DAK*—particularly the two divisional panzer regiments—concentrated as much as possible. On 22–23 November, DAK overwhelmed the 7th Armored Brigade at Sidi Rezegh and then focused its power against the approaching 4th and 22d Armored brigades, both of which were already weakened due to earlier dispersed efforts. When combined, the British brigades had a considerable superiority in numbers and were roughly equal in vehicle quality. By not concentrating its strength for a decisive engagement in this nonlinear situation, the British armor exposed itself to sequential defeats by *DAK*. There were additional reasons for the German tactical success.

At the tactical level, the Germans held several technological advantages that allowed them to concentrate their armor. German infantry battalions were far better armed with antitank weapons than their British and Italian counterparts. The effect of this was that German armor was not needed, at least not as much, to protect exposed infantry units and could remain concentrated, moving around the battlefield like a powerful naval task force, seeking the next important engagement. A German infantry battalion, with its superior 50mm antitank guns plus an occasional "88mm," might not be able to advance in the open against British tanks, but it could reasonably hold its own and fight off attempts by British armor to overrun its position. This facilitated *DAK*'s keeping its own tanks concentrated to achieve local superiority over the British.[24]

Both sides were desperate for intelligence and reconnaissance in such a fast-moving, fluid situation. This had to come primarily from the air forces. In 1941, there was a lack of real-time intelligence from airborne sources, so reports from air reconnaissance could be hours old before it reached division level. Nevertheless, after the first two days, both sides were reasonably familiar with the major formation movements of the other. Radio intercepts (at which *panzergruppe* excelled) and reports from armored car scouting units supplemented and confirmed air reconnaissance.[25] Commanders on both sides would marvel at the sophisticated detection devices of today. However, one should not think that corps and division commanders of 1941 operated in the dark. They often had an excellent picture of their opponent, but not to the depths that are possible today.

The Germans held several technological advantages that allowed them to concentrate their armor. German infantry battalions were far better armed with antitank weapons than their British and Italian counterparts. The effect of this was that German armor was not needed, at least not as much, to protect exposed infantry units and could remain concentrated, moving around the battlefield.

By today's standards, the ground forces of both sides lacked much deep attack capability. Artillery was limited to a range of about 25,000 yards, and the need for adjustment limited even that potential. At the operational level, the British did an excellent job of using their Desert Air Force to interdict supply routes and attack airfields, supply depots and Axis ports. Since *Crusader* went on for days at a very high tempo, Rommel's already tenuous supply situation became desperate and, in fact, dictated his breaking off the battle. Deep battle paid off for Eighth Army.

It should be noted that the air forces of both sides experienced great difficulty providing close support for maneuver forces. This was partly due to the immature close support doctrine of the day, but of great consequence was the inability of both sides' air forces to distinguish friendly and enemy forces during many of the complex, swirling engagements. The huge amounts of smoke and sand kicked up during the massive desert tank battles greatly degraded close air support for

both sides. By today's standards, the most profitable air mission was battlefield air interdiction.

Someone once remarked that the desert is a tactician's paradise and logistician's nightmare. This was particularly true during *Crusader*. Supply columns had to travel long distances between supply dump and forward units. Since there was no front line per se, they could easily fall prey to roving armored car units from the other side. Often supply units were attacked by opposing armored units. The only solution in such situations was to run away—fast. One can imagine the horror of British supply units on 24 November as *DAK* roared east toward the wire.

Battlefield recovery of vehicles was critical to maintaining armored strength . . . Being the last team on the field meant the right to haul off one's own damaged tanks and burn out those of the enemy, for tomorrow morning that same battlefield might be vacant or in enemy hands. This was a particularly important point for the Axis forces since they did not have a large pool of reserve tanks.

Generally speaking, adequate supplies were provided to the combat units of both sides. There were cases of brigade–size formations running out of fuel and being stranded for hours. Because maneuver units were frequently moving, it was very difficult for logisticians to keep up with their current positions. A desperately needed supply column might arrive at the last known position of a friendly unit only to find empty desert or, worse, a waiting enemy. Such was the nature of logistics on a nonlinear battlefield.

Battlefield recovery of vehicles was critical to maintaining armored strength. Being in possession of the field at the end of the day was often regarded as a mark of victory. Being the last team on the field meant the right to haul off one's own damaged tanks and burn out those of the enemy, for tomorrow morning that same battlefield might be vacant or in enemy hands. This was a particularly important point for the Axis forces since they did not have a large pool of reserve tanks as did the British.

Interestingly, control measures were apparently not too much of a problem for either side. Units moved mostly in brigade–size formations, and when they ran into an enemy, the fight would begin. Nearby, friendly units would be called in and fed into the engagement. Certainly, this called for quick thinking and a fair degree of tactical ability on the part of brigade/battalion leadership. Feeding a newly arrived tank battalion into a sand– and smoke–clogged brigade–level fight was no easy feat and often could not be accomplished.[26] Whether deliberately or by default, brigade– and battalion–level engagements often took on the complexion of naval battles with troops fed in and out of the battle with little regard for formal control measures. Following an engagement, the winning unit usually found itself alone on the desert, surrounded by both sides' wrecked vehicles, with open flanks and the enemy now withdrawn miles away. This was the time to recover and refit, for another engagement might suddenly occur.

It must be clearly understood that despite the tactical prowess of *DAK*, and its clear superiority in dynamic, nonlinear combat, the Eighth Army won. It did so mainly through attrition. While there was parity in manpower, Eighth Army had a great superiority in numbers of armored vehicles and supplies. Here can be seen the importance of Auchinleck's insistence that the battle be continued despite the defeat of British armor and Rommel's "dash to the wire." The Eighth Army hung in there and literally wore the *panzergruppe* down. In this, it was greatly assisted by the deep battle efforts of the Desert Air Force, which kept hammering at the Axis supply lines, preventing the *panzergruppe* from replenishing its supplies.

The above paragraph should be a sobering thought. The Germans were unquestionably more nimble and dynamic on the battlefield. Their tactics were generally superior to the Brit-

ish; but at the operational level, they were gradually ground down by a determined foe who had cruder battlefield technique, but more resources. Nimble, aggressive nonlinear tactics can, and did, yield great effect against an overly dispersed or lumbering opponent, but over time, preponderance of resources can wear down the qualitatively superior force.

Panzergruppe Afrika needed to win the battle in seven to 10 days, so the British superiority in materiel would not tell against them. Possibly, if Rommel had listened to Crüwell on 23 November and kept his armor near Sidi Rezegh to complete its victory over 7th Armored Division, and *then refit* prior to going off to rescue the frontier garrisons, he probably would have won. Instead, he tried to do too much with a depleted, tired force—a dispersion of effort much like the British. In fact, although *DAK* had won an impressive tactical victory near Sidi Rezegh, the Germans had reached their culminating point and needed rest and resupply.

Crusader was a truly remarkable battle, providing many useful insights into high-intensity, nonlinear combat. Weapons and technology have changed much since 1941. Today's sensors would have enabled both sides to have a much clearer picture of the battlefield. Today's ground-based deep attack systems would have produced more casualties than the bombs of 1941-era aircraft. Yet many of the lessons of *Crusader* can be of value to us today. This was a very intense, nonlinear battle that was decided at the operational level. As the US Army prepares its doctrine, organizations and equipment for the nonlinear battlefield, we should combine our understanding of the potential of today's and tomorrow's weapons with the study of battles like *Crusader* to give us a guide for our Army of the future. **MR**

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The Iraqi Army Forged in the Gulf War

Major John F. Antal, US Army

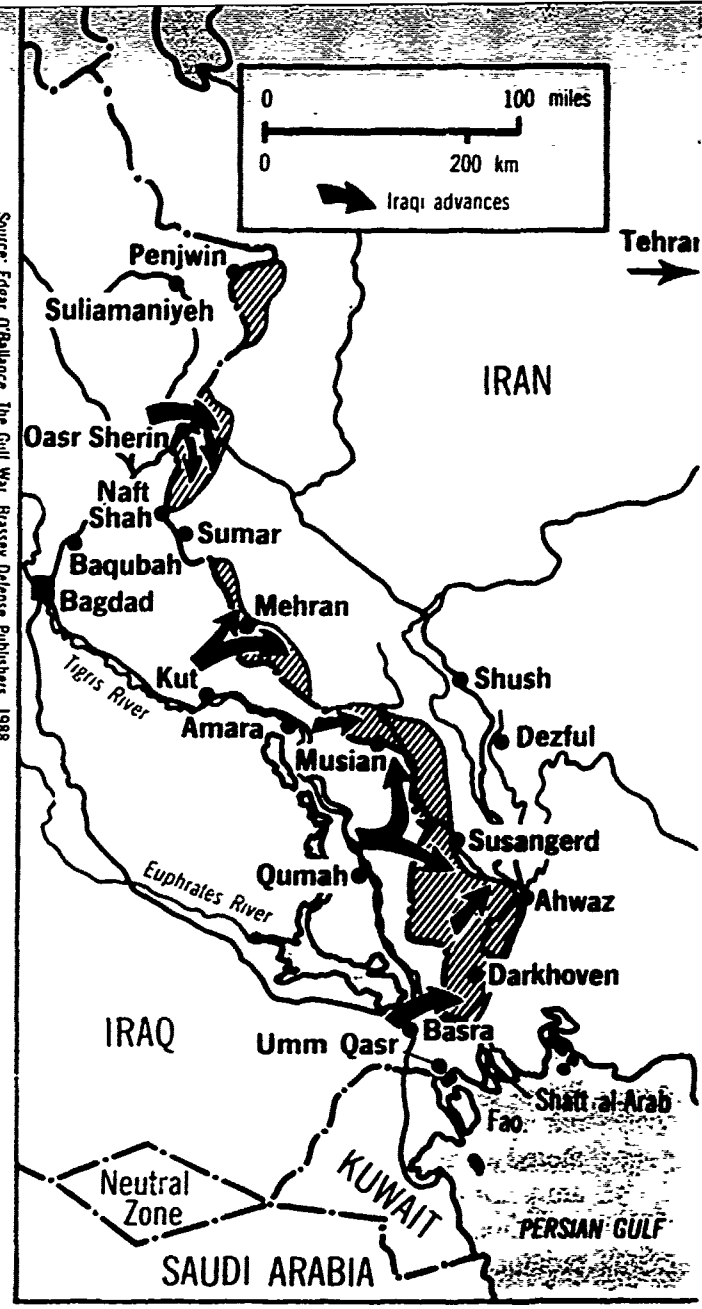
In the aftermath of its lightning-quick invasion of Kuwait, there has been much debate and speculation as to the capabilities of the Iraqi armed forces. The author looks at the recent performance of Iraqi forces over the course of eight years of war with its gulf neighbor, Iran, as the best measure of its current capabilities. He sees an army that is battle-hardened and more capable of complex, combined arms operations than envisioned by many other analysts.

The experience of the war has further redirected the military in Iraq away from domestic political intervention and toward national defense. The intensity of a protracted war against a feared enemy has created a new tradition. The Iraqi military of the future will find that its principal legacy dates from 1980 [the beginning of the Iran–Iraq war] *and not 1936* [the first military coup in Iraq].[1]

THE IRAQI army has been disregarded by many Western "experts" as merely a large moderately professional force, capable of fighting only a static style of warfare against a largely light infantry–equipped enemy. But it was a revitalized Iraqi army that defeated the Iranians in five decisive battles and forced the Ayatollah Khomeini to drink "the cup of poison" and agree to peace terms in 1988. It was the Iraqi army that captured Kuwait in less than a day by conducting a lightning, surprise attack during the early hours of 2 August 1990.

The Iraqi army that conquered Kuwait is the product of eight years of war against Iran. Outnumbered three to one by the Iranians, the Iraqi army remained a cohesive and effective fighting force throughout the long Gulf War, despite the religious appeal of the Shi'a clerics of Iran to overthrow Saddam Hussein and join the Islamic fundamentalist revolution. The Iraqis won the Gulf War because they "planned for and successfully executed complicated, large–scale military operations and shrewdly managed their resources. Claims that they won simply by using massive amounts of chemical weapons cannot be substantiated."[2]

Sparing no expense, and with ruthless determination, Hussein has created a military force of unparalleled size and capability in the Middle East. Before 2 August 1990, Iraq was the largest importer of military goods in the world, dwarfing the second–ranking country, Saudi Arabia, by a nearly 2–1 margin.[3] Boasting a force of a million men, the Iraqi army that invaded Kuwait is the largest and best–equipped Arab army in modern times. This article takes a close look at the army that made Hussein a dangerous regional "superpower," and led to the current gulf crisis.[4]



Source: Edgar O'Ballance, The Gulf War, Brassey Defense Publishers, 1988

Figure 1. Iraqi Advances: September-December 1980

Iraq versus Iran, the First Year

In September 1980, Hussein saw a chance for a quick victory against Iran. Iran was involved in the agony of the bloody Islamic fundamentalist revolution generated by Khomeini. The Iranian revolution and the executions of the unfaithful and politically unreliable had decapitated the Iranian military. Even though Iran outnumbered Iraq in total population by roughly 45.2 million to 15.5 million, the Iraqis believed that their higher–quality armored and mechanized divisions could beat the weakened Iranians and force a quick termination of the war. Hussein expected a limited war, against a

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weak enemy, that would last three to five weeks. He was wrong.

Attacking with four divisions (about 45,000 troops) across a 450-mile front, the mechanized forces of the Iraqi army, equipped with T-62 and T-55/54 tanks, led the attack into Iran. "Pride of place was held by armor, there being four armored divisions, each with two armored and two mechanized brigades."[5] The surprised Iranian border guards and local militia were unable to put up effective resistance against the Iraqi armored drive. By the end of October, the Iraqi army slowly occupied a sizable foothold in Iran, including the valuable oil-producing Khuzistan province.[6]

Incensed by the attack, Iran declared full mobilization and began to fight back. In spite of the ease of their initial success, Iraqi operations during this early period were depicted by slow and cautious movement of their armored formations, "usually behind long-range artillery barrages."[7] The Iraqis moved deliberately, within range of the protection of their artillery and air support, and followed by slow-moving and extensive logistic trains. Short on infantry, the Iraqis made the mistake of sending armored formations, without infantry support, to capture major cities, such as Khorramshahr. These tactics failed and produced heavy losses from Iranian antitank ambushes in close street fighting.

As the Iranian defense stiffened, the Iraqi casualty list grew. Unwilling to take heavy losses, the Iraqis tried to replace their lack of assault infantry with firepower. No amount of artillery bombardment, however, was able to dislodge the Iranians. It was not until the Iraqis quickly retrained their special forces units, a part of the elite Republican Guards, for street fighting that they achieved any success in taking fortified Iranian cities. The first battle of Khorramshahr, which ended on 24 October 1980, cost the Iraqis 7,000 casualties and "over 100 tanks and other armored vehicles, like self-propelled guns. Afterwards, both combatants referred to Khorramshahr as '*Kunistan*,' meaning city of blood."[8]

During the first two years of war, Iraqi battlefield performance was a mixed bag. When given time to conduct detailed planning, Iraqi divisions were capable of conducting complex operations such as the division-size, opposed river crossing of the Karun River on 10 October 1980. "Iraqi soldiers engaged in the early battles were regulars who performed well under fire, being reasonably competent, proving to be very determined and brave, as shown at the battle of Khorramshahr."[9]

But as the Iranians regrouped from their initial setbacks and began to counterattack, "Iraqi battlefield performance appeared to be incredibly inept."[10] A centralized, Soviet-style, detailed-orders approach to operations caused many missed opportunities. Junior officers were reluctant to take charge and show initiative. An overpoliticized officer corps, where commanders, mostly colonels and above, were chosen more for their political loyalty than their military competence, began to work against Iraq. To add to its tactical problems, cooperation between the Iraqi army, air force and navy was virtually nonexistent.

By mid-October 1980, regular Iranian army units entered the battle in force. Iraqi units besieged the prestigious city of Abadan, but unwilling to take heavy casualties after the bloodbath of Khorramshahr, resorted to an artillery siege. Heavy rains began falling in November and December and slowed the Iraqis' attempt to continue the offensive. A fifth surprise Iraqi thrust, in the northern Penjwin area toward the town

of Marivan, was conducted on 24 December 1980, almost entirely by infantry forces. Nevertheless, the rains brought battlefield movement to a standstill and the war entered a new phase as the Iranians used the respite to prepare for the offensive.

Iran versus Iraq, Stalemate

Impatient for revenge, Iran took to the offensive in January 1981. During the month of January, Iraq and Iran fought some of the largest tank battles since the 1973 Arab–Israeli War. In the battle of the Kharkheh Plain, the Iraqis skillfully drew the lead Iranian armored brigade into a fire sack, destroying over 100 Iranian tanks. In all, Iran lost the better part of two tank divisions to the Iraqi defenses. This tactic, using a light armored screen and withdrawing to entice the invaders into a carefully arranged killing zone, was used by the Iraqis time and time again with excellent results.

But the push of massive Iranian numbers began to turn the tide. Unable to terminate the war quickly, the Iraqis resorted to a static defensive strategy in order to reduce their own casualties. By employing a dug–in defense, the Iraqis hoped to wear the Iranians down through attrition. By this time, the Iraqis had "lost about 10,000 killed and about 20,000 seriously wounded."[11]

By late 1981, battlefield events began to turn in favor of Iran. The Iranians enjoyed a series of successes, lifting the siege of Abadan and driving the Iraqis across the Karun River. Continuing the pressure, the Iranians mounted "human–wave" assaults during the rainy season. Losses on both sides began to mount as the war dragged on without a decision. It appeared that Iran could withstand the human attrition better than Iraq, and the Iranians massed huge armies of infantry to wear down the Iraqi positions. The Iranians, on the other hand, were constantly on the offensive, regardless of their losses, and believed that final victory was near.

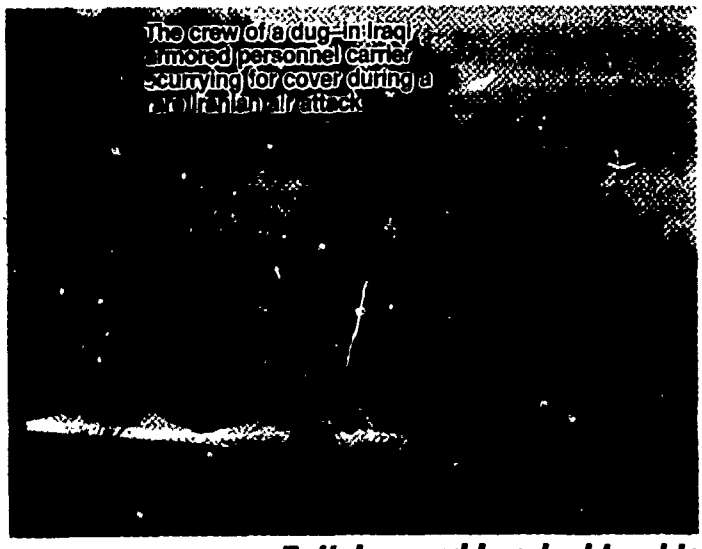
At this time, the Iraqis began to reevaluate their tactics. "The Iraqis had put themselves at a disadvantage in Operation *Fatah*, for example,

Iraqi forces in Khorramshahr. Although the town was defended [illegible] equipped [illegible] hold [illegible]

Incensed by the attack, Iran declared full mobilization and began to fight back. In spite of the ease of their initial success, Iraqi operations during this early period were depicted by slow and cautious movement . . . Short on infantry, the Iraqis made the mistake of sending armored formations, without infantry support, to capture major cities. . . [and suffered] heavy losses from Iranian antitank ambushes in close street fighting.

when they gave up aggressive mobility, which is the essence and purpose of armored warfare, to try to hold static defenses, without being properly equipped and conditioned for such a role."[12] With the fall of Khorramshahr in May 1982, which had been turned into a "veritable Stalingrad" by the Iraqi army, the static defense tactic was clearly bankrupt.[13] The "Iraqis effectively lost what they had occupied and announced a unilateral withdrawal from Iran."[14] Moving back to defensive positions inside Iraq, the Iraqis prepared to fight a long, total war with Iran.

Both Iran and Iraq had trouble supplying their war efforts. Modern war consumed a tremendous amount of men and materiel. Time was needed to rebuild forces, and the war often included long periods of preparation for combat as the Iranians would marshal their forces for



Both Iran and Iraq had trouble supplying their war efforts. Modern war consumed a tremendous amount of men and materiel. Time was needed to rebuild forces, and the war often included long periods of preparation for combat as the Iranians would marshal their forces for another push, with the Iraqis digging in even deeper.

another push, with the Iraqis digging in even deeper and making their positions more formidable.

The Iranian army did show several episodes of tactical brilliance such as the Cannae–like destruction of three Iraqi divisions, two armored and one mechanized, during "Operation *Fatah al–Mobin* (Clear Victory)," and by conducting combined arms operations that included an amphibious assault, resulting in the capture the Al Faw Peninsula in 1986.[15] Iranian victories at this time were due both to the professionalism of their regular army leadership and a total disregard for casualties.

The Iraqi war effort seemed to be collapsing with the capture of Al Faw and Mehran in 1986. Once again Khomeini demanded another massive offensive to crush Hussein. Preparing their best punch, the Iranians planned for the final offensive aimed at the city of Basra. Many analysts concluded that Iraq, despite its use of poison gas, was about to lose the war.

Basra, the second largest city in Iraq, is an important communications center that guards Iraq's access to the Persian Gulf. If Basra fell, Iraq would be cut off from the gulf and would suffer a traumatic psychological blow. The Iranians took a year to prepare for this "final offensive." The Iraqis understood what was happening and massed their own forces accordingly. Edgar O'Ballance, in his book, *The Gulf War*, describes the Iraqi defenses at Basra.

"The city of Basra was strongly defended by earthworks in successive arcs in which were set bunker and weapon positions, covered by miles of barbed wire fencing and entanglements, and protected by extensive minefields. Small canals had been constructed as obstacles against enemy vehicles. The defense of the city was the responsibility of the Iraqi 3rd Army Corps, which now had seven divisions in the region, together with a number of independent brigades and Special Forces units."[16]

The battles for Basra rival that of Verdun and lasted almost a year. The Iranians lost almost three times as many casualties as the Iraqis and bloodied themselves to death against the Iraqi defenses. Basra, named the "Iron Ring," was under siege of Iranian artillery for almost seven months. To aid the defense, the Iraqis "flooded whole areas of the front and Iraqi engineers even electrified Fish Lake to electrocute the Iranians as they attempted to cross.[17] With only meager gains and tremendous casualties, Iran called off its offensives in 1987. Iran had reached its culminating point.

The Last Year of the War

Sensing that the Iranians were unwilling to continue, Iraq finally went to total mobilization and reorganized its army for offensive warfare. The Iraqi High Command clearly learned the lesson that the army "was paying an unacceptable price for its lack of infantry assault and infiltration capability."[18] The last manpower pool, the college students who had been previously deferred from the draft, were enlisted in new, offensively trained Republican (often called Pres-

The push of massive Iranian numbers began to turn the tide. Unable to terminate the war quickly, the Iraqis resorted to a static defensive strategy in order to reduce their own casualties. By employing a dug-in defense, the Iraqis hoped to wear the Iranians down through attrition.

Iraqi antiaircraft gunners with a Soviet-built 14.5mm gun in the marshes north if Kuwait.

idential) Guard units. The Iraqi army was given new training, and battlefield control was decentralized under proven, tactically competent military officers.

In addition, Iraq struck at all Iranian economic targets in reach. In 1988, Iraq launched a new "Missile War" with redesigned Scud heavy artillery rockets with increased range. "Between February and late April, Iraq fired over 120 missiles into Teheran, Isfahan, and even into the Shias' holy city of Qom; no place in Iran was safe from missile attack."[19] The inability of the Iranian regime to protect the cities of the homeland from Iraqi missile attack had a demoralizing effect on the Iranian troops in the field.

It was now time for the Iraqis to take to the offensive. In a campaign that consisted of five blitz-style battles, the Iraqi army virtually annihilated the Iranian army. These battles demonstrate the professionalism of the Iraqi army officer corps and the ability of these officers to employ modern weapons in a combined arms battle against the Iranians. They also demonstrate the capability of the Iraqi soldier. As one US analyst noted in a recent Army War College study, these five battles were decisive in ending the Iran-Iraq War:

"In the first battle, 17-18 April [1988], the Iraqis retook the Al Faw peninsula . . . The second battle saw Iran surrender land around the pressure point of Basra. The Iranians had seized this territory in 1987, after a desperate campaign that went on for over three weeks and cost them some 70,000 casualties. The Iraqis took it back in 7 hours . . . One month later, the Iraqis struck at Majnoon, the site of the Middle East's largest undeveloped oil fields. . . Again, the Iraqis retook it in a matter of hours. . . The fourth battle occurred in the vicinity of Dehloran and effectively removed any remaining threat toward Baghdad. In the fifth and final battle, the Iraqis drove some 40 miles into Iran to Qasr-e Sherin/Kermanshah. Iraq's military commanders apparently were prepared to penetrate farther, but were recalled by the civilian leadership. . . Fleeing Iranian units abandoned so much equipment in the last days of combat that Iraq has been able to give away captured weapons to its allies. . . It will be another five years, observers believe, before Iran can recoup something of its former military strength."[20]

How the Iraqis Attack

The battle for Al Faw on 17 April 1988, was the most stunning evidence of the new prowess of the Iraqi army. The Iranians had 15,000 troops dug in at Al Faw and had held the peninsula since 1986. The Iraqi VII Corps and major elements of the Republican Guards conducted a coordinated attack designed to recapture the Al Faw peninsula. "There was a thrust by elements of the regular army (VII Corps) through palm groves that skirt the Shatt-al-Arab. Coincident with this, was an attack by the Republican Guards along the Kor Abdullah Channel. With the two main thrusts came amphibious landings

Iraqi tanks in operation near Dezful, Iran.

Wide World Photos

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The [Republican] Guard units are a separate organization within the army, much like the SS was in the Wehrmacht during World War II. The Republican Guards play a vital role in the tactical employment of the Iraqi army and were responsible for most of Iraq's battlefield victories.

behind the Iranian lines."[21] After stiff resistance, Al Faw fell to the Iraqi army after only 36 hours of fighting.

The Iraqis employed approximately 200,000 troops in this operation. Surprise, the skillful use of attack helicopters to provide "close air support" for the advancing troops and the close coordination of attacking forces, reduced Iraqi casualties to only a few hundred men. "Iraq, consistently sensitive to casualties, apparently wanted the Iranians to flee, as it left one pontoon bridge over the Shatt untouched, across which the Iranians ultimately rushed in large numbers."[22] The Iraqi army, after its victory, quietly moved to training areas and prepared for its next offensive.

The next battle occurred at Fish Lake. On 25 May 1988, the Iraqis conducted a high-speed, armored attack of the Iranian defenses. Starting with a massive artillery preparation, the Iraqis attacked with several thousand tanks and totally smashed the Iranians, who could muster less than 100 tanks. "Within 5 hours, the Iranians were in full flight."[23] The battles for the Majnun Islands, Dehloran/Zubiadat and Qasr-e-Sherin/Kermanshah finished off the Iranian army and

sent it retreating back to Iran.

In each of the five battles of the campaign, the Iraqi army outnumbered the Iranians by as much as 20 to 1 at the point of decision. This was an apparent attempt to reduce Iraqi casualties and ensure quick victory. All five battles included long-range artillery fires, the integration of chemical fires (delivered by mortars, helicopters, rockets, aircraft and artillery), helicopters in hunter-killer groups and as fire support, close air support (actually operating as battlefield air interdiction) and massed armor. The Iraqis used modern combined arms tactics in the offensive to gain victory against the Iranians.

How the Iraqis Defend

Outnumbered by Iran in overall manpower, Iraq was forced to defend against Iranian assaults for most of the Gulf War. Confronted by massive Iranian human-wave assaults, the Iraqis had years to perfect their defensive techniques. This defensive was typified by well-prepared defenses consisting of a defensive belt "studded with bunkers, weapons replacement and dugout shelters for infantry. . . Behind this strong frontal trench were communication trenches leading back to large underground shelters."[24]

The typical Iraqi defensive position resembled the Soviet pattern with three dug-in defensive bands about six miles deep. Each defensive band consisted of traingular-shaped strongpoints, with overlapping fields of fire and plentiful use of barbed wire and mines. Tanks were normally dug in to hull defilade with interlocking fields of fire. Massed artillery, again Soviet style, was used to help break up Iranian attacks. Iraqi attack helicopters skillfully employed pop-up and shoot tactics to inflict heavy losses on Iranian assault formations with precision wire-guided munitions.

With over five years to prepare positions, the Iraqis became master fortification builders. They can be expected to dig in whenever they are on the defensive. The roles of the combat and construction engineers played a vital part in Iraqi army defensive operations. "The Iraqis had plenty of heavy construction equipment and a

Iranian "martyrs" shortly before a human-wave attack on Iraqi fortifications

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very competent Engineer Corps."[25] This equipment and expertise was put to good effect and made the Iraqi positions very formidable.

But Iraqi defensive tactics were not just relegated to static defense. As Iraqi tactical performance improved, armored heavy units were held back in prepared positions to act as mobile counterattack forces. By 1985, the mobile armored defense was the norm in the Iraqi army.

"Iraq's new ground tactics deliberately allow Iranians to penetrate a selected area of the front and pour in their reserves. Then, while artillery pins them in place and air strikes interdict their reinforcements, the Iranian penetration is cut up and annihilated by Iraqi armored and mechanized units attacking from one or both flanks with air, artillery and infantry support. Those familiar with US Army tactical doctrine will note that Iraq's mobile defensive tactics have all the elements of "combined arms" operations, albeit in a well-rehearsed, 'set-piece battle' atmosphere."[26]

Organization of the Iraqi Army

The Iraqi army is organized along Soviet lines with seven corps headquarters and a total of seven armored/mechanized divisions, 39 infantry divisions (including the Peoples Army militia), four Presidential Guard Force divisions (three armored, one infantry and one commando battalion), and more than 20 special forces brigades. An Iraqi corps usually consists of four divisions, with each division consisting of approximately 10,000 men, and the corps normally with 40,000 to 45,000 troops.[27]

The Republican Guard units are a separate organization within the army, much like the SS was in the *Wehrmacht* during World War II. The Republican Guards play a vital role in the tactical employment of the Iraqi army and were responsible for most of Iraq's battlefield victories. The Republican Guard is an elite "mini-corps, with 30,000 men, commanded by General Hussein Rashid."[28] Consisting of 16 brigades of the most politically reliable troops, equipped with the best and latest weapons, the units of the Republican Guard forces will act as the shock troops of any major Iraqi operation.

The Iraqi army has incorporated the "lessons learned" from their battles with Iran and has improved its training and organization. Units are organized for independent combined arms action with engineers, commando-infantry, fire

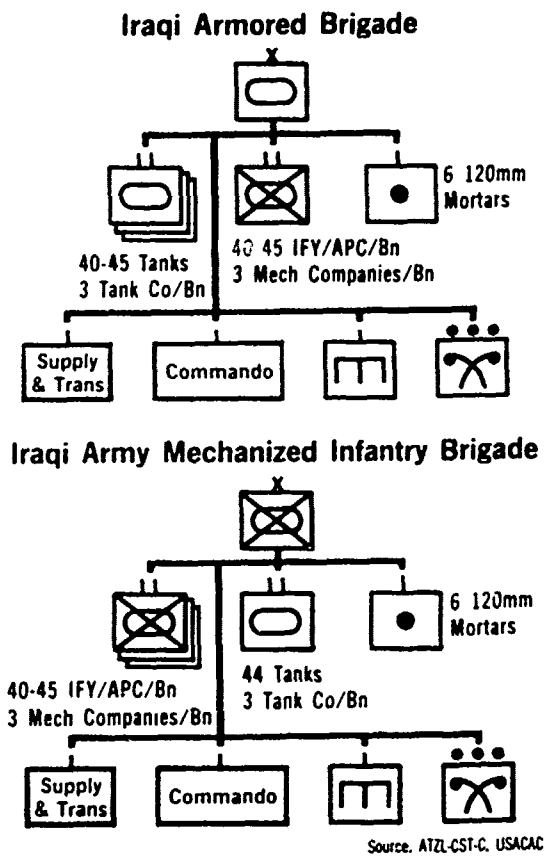


Figure 1.

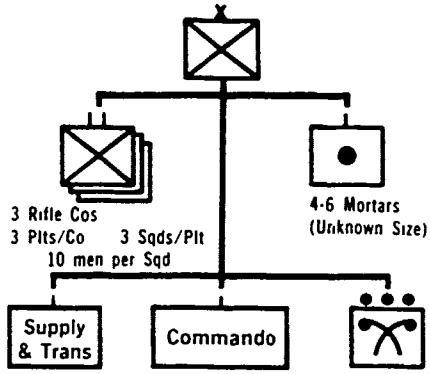
Confronted by massive Iranian human-wave assaults, the Iraqis had years to perfect their defensive techniques. . . The typical Iraqi defensive position resembled the Soviet pattern with three dug-in defensive bands about six miles deep [consisting] of traingular-shaped strongpoints, with overlapping fields of fire and plentiful use of barbed wire and mines. Tanks were normally dug in to hull defilade with interlocking fields of fire. Massed artillery . . . was used to help break up Iranian attacks [and] attack helicopters skillfully employed pop-up and shoot tactics.

support and chemical assets (chemical warfare is a normal part of Iraqi doctrine) in each brigade structure. Figures 1 through 3 depict the latest unclassified data on the organization of Iraqi brigades.[29]

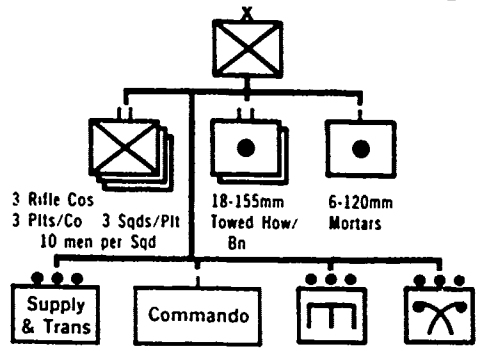
There is a tendency in the West to disregard Iraq's victory over Iran as the mere ascendance of firepower over human-wave assaults. This is hardly the case, as the Iraqi military has shown a high degree of sophistication in its planning and conduct of operations. The Iraqi army has shown great tactical improvement since 1980. They are much better fighters than most military analysts formerly believed. As one analyst said in a 1990 assessment of the Iraqi army: "They have matured over the course of 8 years of war with Iran. Although they are weak in some areas, the Iraqis are a force to be reckoned with."[30]

In spite of this progress, the weaknesses of the Iraqi army appear to remain the same. The Iraqis require detailed planning and careful execution

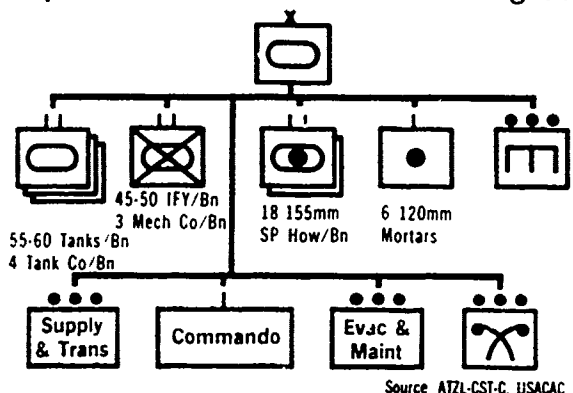
Iraqi Army Infantry Brigade



Republican Guard Force Infantry Brigade



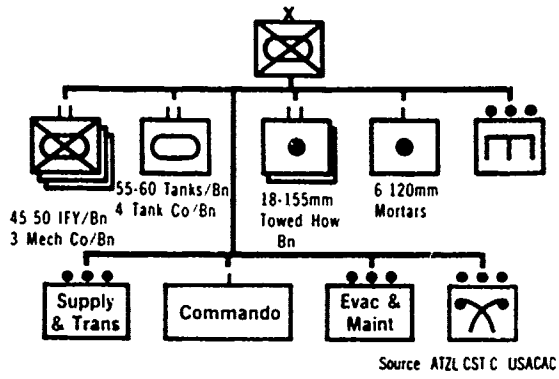
Republican Guard Force Armored Brigade



Source ATZL-CST-C, USACAC

Figure 2

Republican Guard Force Mechanized Brigade



Source ATZL CST C USACAC

Figure 3

to perform effectively. They are tenacious in the defense, but "doctrinely inclined to fighting set-piece battles seeking to lure their enemy into prearranged killing zones where, once the artillery has broken the momentum of the attack, an armor heavy counterattack would be launched."[31] They have a short logistic tail, have problems supporting extended drives and are still beginners at effective cooperation between joint forces. Finally, there is always the tendency by the Ba'ath Party to politicize and rigorously control the armed forces to maintain Hussein's grip on power.

The first Gulf War ended on 18 July 1988. An army does not change quickly. Today, the Iraqi army can be expected to fight using similar tactics and command and control techniques that brought success in the war against Iran. Hussein told his people in a speech in November 1989 that "you entered the war with 12 divisions . . . now we have 70. The entire world has not seen such a development. Neither in World War I or World War II . . . has the world witnessed a country of 19 million producing 70 divisions."[32] Only time will tell if the Iraqis are a match for a well-trained, mechanized combined arms force. ***MR***

NOTES

1. Frederick W. Axelgard, *A New Iraq? the Gulf War and Implications for US Policy*, The Center for Strategic and International Studies (New York: Praeger, 1988), 58
2. Stephen C. Pelletiere, Douglas V Johnson II and Leif R Rosenberger, *Iraqi Power and US Security in the Middle East*, Strategic Studies Institute, US Army War College (Carlisle Barracks, PA: 1990), ix, (hereafter referred to as Pelletiere)
3. Axelgard, 48.
4. Edgar O'Ballance *The Gulf War* (London: Brassey's Defence Publishers, 1988), iii.
5. Ibid., 28
6. Ibid., 34
7. Ibid., 37.
8. Ibid., 38
9. Ibid., 47.
10. Pelletiere, 4 An additional insight into Iraqi ineptness was offered by Frederick W Axelgard in his book, cited above, *A New Iraq? The Gulf War Implications for US Policy*, 52 Analysts of the war have ascribed Iraq's battlefield failing to many causes; for example, mistakes in military strategy and tactics. But a good deal of fault has also been attributed to the suspicion between Iraq's political and military hierarchies and its effect on the management of the war. The "Ba'thization" of Iraq's officer corps, for example, one of the prime tools used by Ba'th Party to keep tight control of the military, lowered the quality of military professionals at the command level. Moreover, the central leadership in Baghdad, and Saddam Hussein himself, have been directly involved in military decisions at both the strategic and tactical levels The politically based fear of local commanders to take any initiative in the absence of directives from Ba'thi leadership has repeatedly frozen junior officers in circumstances requiring immediate tactical decisions. Time and time again since 1980, Iraq has reaped the harvest of its earlier legacy of ensuring that military officers were selected "on the basis of political dedication rather than military competence."
11. O Ballance, 74
12. Ibid., 87.
13. Ibid., 84.
14. "Iraq", *Defense and Foreign Affairs Handbook*, ed Gregory R Copley, (Alexandria VA International Media Corp 1989), 517
15. O Ballance 79
16. Ibid., 94
17. Ibid 92
18. Anthony H Cordesman, *The Iran–Iraq War and Western Security 1984–87: Strategic Implications and Policy Options* (London James Publishing Company, 1987), 97
19. Pellebere, 23
20. Ibid 1–3
21. Ibid., 25
22. Ibid., 28
23. Ibid. 29
24. O'Ballance, 101
25. Ibid., 41
26. David Segal, "The Iran–Iraq War: A Military Analysis," *Foreign Affairs* (Summer, 1988):957. A good example of Iraqi mobile defensive tactics were displayed in March 1985, in a battle that occurred just north of Qurnah as the Iranians penetrated Iraqi lines to cut the Basra–Bahghdad road: "For command purposes, the Iraqi battlefield was divided into two parts, one on either side of the Iranian 'human–wave' thrusts .. The Iraqis held their mobile brigades in good lay–back positions before the Iranian offensive got into full swing. Once the Iranian threat was clearly identified and located, they quickly deployed to contain the attack. At the height of the battle, the Iraqis had eight divisional headquarters in more or less static locations, with 25 mobile brigades of various types being switched form one divisional command to another as required. For example, at one juncture, the Republican Guard Divisional Headquarters had seven brigades under command, while the 1st Special Forces Divisional Headquarters had eight. On the 15th, the Iraqis began their counterattack, forming a three sided 'killing box' around the Iranian forces By moving mobile brigades into position and subjecting the trapped Iranians to a continuous hail of fire–power, they forced the survivors, who by this time lacked air cover, backwards during the night." Edgar O Ballance, *The Gulf War*, 163.
27. Richard Jupa and Jim Dingeman, "How Iran Lost/Iraq Won the Gulf War," *Strategy and Tactics*, no. 113 (Cambria, CA March–April 1990), 51
28. Ibid., 51 It is interesting to note that Rasid's daughter married Saddam Hussein's son This is another example of how personal loyalty plays a prominent role in the professional advancement of members of the Iraqi army officer corps
29. Figures 1–3 depict the latest unclassified data on the organization of Iraqi brigades This "unclassified" information was issued by Fort Leavenworth, Combined Arms Committee, Threats Department, August 1990
30. Pelletiere, 5 An in–depth analysis of the authors of *Iraqi Power and US Security in the Middle East* is provided below:

The Iraqis can be formidable in the defense, but we must also remember that their experience is against masses of fanatical light infantry which had limited artillery or armor support and almost no air support This is not to discount their experience altogether, but it must be kept in mind. We have seen the Iraqis execute offensive operations routinely supported by deep fires and integrated chemical fires These have been executed as short jab counterattacks within a clear doctrinal framework. But we have also seen longer ranging offensive operations which penetrated to depths of 40–plus miles What we do not know about these deeper attacks is how far they might be pushed and sustained against a balanced enemy who had some capability in the air We do not know how much mental flexibility the current officer corps has been able to develop It seems fairly certain that the inflexibility seen in the early years of the war was a product of rigid central control probably aggravated by a promotion policy which had political reliability as its first criterion Whether inovations made subsequent to 1982 have altered the mindsets of the Iraqi commanders we do not know. 40.
31. Ibid., 39.
32. Ibid., 93 (From *FBIS–NES–88–22*, 16 November 1988).

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Air Defense Artillery
First to Fire

Major Dale E. Brown, US Army

Many of the concepts underpinning AirLand Battle will not change in the emerging doctrine. One of these is the necessity of clearing the air of enemy air power so that our ground forces can accomplish their missions. The author confirms this important truism with evidence from recent training exercises during* REFORGER *and at the National Training Center. He offers lessons that clearly demonstrate the value of our air defense artillery assets to the combined arms team.

"NEVER more than six feet off the ground." That is how the prospective enemy threat, absent of air capability, was described by countless infantry and armor units to retired Army Major General Victor Hugo, former commander of the 32d Army Air Defense Command. Although this perception is slowly changing at places like the National Training Center (NTC), Fort Irwin, California, where air defense artillery (ADA) is proving its worth on the combined arms team, ADA's nascent slogan of "First to Fire!" is still all too often greeted by our combined arms brethren with an attitude of "Why? There won't be any enemy ground forces near you." Despite the US Army Field Manual (FM) 100—5, *Operations*, pronouncement that "the airspace of a theater is as important a dimension of the ground operations as the terrain itself," the aforementioned view is not surprising, given the Army's history, nor could it be potentially more dangerous in a world of adversaries armed with significant air power.

Hugo's assessment of the presented enemy threat is not a unique perspective. As a corps ADA representative in a recent division-level command post exercise, I too witnessed the general indifference to air defense matters. Although considerable hostile air activity had transpired, the mid-exercise briefing to the senior corps officer was devoid of air defense content until I requested to present the current ADA situation. Prior to that moment, discussion ranged from truly grave issues such as whether we were counterattacking through a minefield to trivial matters such as the stockpiling of white camouflage garments in Germany. The "air campaign" consisted only of friendly close air support and a deep strike by the corps aviation brigade.

One aircraft. . . proceeded to drop cluster bombs on a previously untouched division support area, destroying or damaging 50 trucks. This disconcerted the CSS representatives to the point that they questioned whether they could continue their mission. That one aircraft could cause such damage was novel and prompted them to seek additional ADA protection.

Another exercise incident also was illuminating. The simulation computer deemed one particular sortie of six Fencer ground attack aircraft to have been destroyed on ingress by Patriot (surface-to-air missile) and divisional ADA assets. In order to foment logistic play, I agreed to let one aircraft penetrate. It proceeded to drop cluster bombs on a previously untouched division support area, destroying or damaging 50 trucks. This disconcerted the combat service

support representatives to the point that they questioned whether they could continue their mission. That one aircraft could cause such damage was novel and prompted them to seek additional ADA protection.

This lesson was well learned, but this mistaken attitude was also present at the senior command

It is doubtful that any current member of the Army has been subjected to intentional air attack. . . The most common source of combat experience in today's Army, Vietnam, was devoid of enemy air. Indeed, it can even be argued that the ultimate outcome of any large–scale US ground operation in Korea or World War II was never decided by enemy air attack.

level in the 1987 *REFORGER* exercise. The German newspaper, *Die Welt*, reported that US commanders refused to accept that they did not have unquestioned air superiority, "a tactical error of great consequence to the [NATO] alliance."[1]

The Historical Record. It is doubtful that any current member of the Army has been subjected to intentional air attack. Our institutional memory contains no "lessons learned" for the air threat, as it does for Vietnam–style counterinsurgency or ULTRA–inspired counterintelligence. The most common source of combat experience in today's Army, Vietnam, was devoid of enemy air. Indeed, it can even be argued that the ultimate outcome of any large–scale US ground operation in Korea or World War II was never decided by enemy air attack. The campaign in Western Europe, source of many of our doctrinal lessons, is exemplary in its absence of enemy air activity. Cornelius Ryan in *The Longest Day*, tellingly recounts how the Normandy landings, perhaps the operation most vulnerable to air attack, were harassed only by a two–lane strafing raid.[2]

"Allied planes were painted silver while ours are colorless and invisible" was a bit of black humor among the German soldiers.[3] With the notable exceptions of the Remagen bridge and the defense of Antwerp against V1 rocket attacks, Army antiaircraft gunners made their greatest contributions in a ground support role. The official histories mark the infrequent appearances of the *Luftwaffe* with words like "For the first time in months antiaircraft units got an opportunity to do what they were trained to do."[4]

Yet, when the planes did appear, they had an effect far beyond any actual damage. The prospect of sudden, violent attack from the sky has always induced a paralysis among soldiers not accustomed to this form of assault. Consider the following abridged anecdote from the oral history of Major General Elwood (Pete) Quesada, commander of the IX Tactical Air Command in the World War II European Theater:

"I was having breakfast with [General Omar N.] Bradley and he said, 'Look Pete, we had a bad time yesterday. The V Corps was supposed to jump off and they were just stopped dead in their tracks.' 'What from?' and he showed me a teletype from the corps commander that indicated that they were completely prevented from launching their assault by a very, very severe German air strike. 'Look, Brad, I would like to get to the bottom of this because it is obviously important to you or you wouldn't bring it up.' So we got into my jeep and we went to see [Major General Leonard T.] Gerow, the corps commander. Gerow showed me the telegram from [Major General Charles H.] Gerhardt, the divisional commander and I said, 'If the German air force is keeping you from launching your attack, we just got to do something about it. Let's go see Gerhardt.' When we got to the division HQs, Gerhardt started on me, 'Goddam you Pete, when are you going to get the German air force off my back? Here is a message I got from him [the regimental commander] and he was just pinned to the ground.' 'Well let's go see him.' So now we got Bradley, Gerow, and Gerhardt at the regimental CP. When asked what happened the regimental commander explained, 'We were ready

A lesson of the 1980s that has been hard to accept is the spread of military technology to lesser developed countries. This point was brought home by the sinking of the HMS* Sheffield *by an Argentinian Exocet missile and reinforced by the Iraqi use of the same weapon against the USS* Stark. . . *[TBMs] are [also]proliferating throughout the Third World and make the limited antitactical ballistic missile capability of Patriot even more important.

to jump off at 10:13 when these planes came over the CP and set that half track on fire.' 'How many were there?' 'Two of them.' 'Drop any bombs?' 'No.' 'Any casualties?' 'Yes, our cook,' and he called for the cook who limped over because he had shrapnel in his buttocks. I turned to Bradley and said, 'Brad, we got a case where your whole Army is stopped in this particular case by two airplanes that dropped no bombs, shot a cook in the ass, and set a half track on fire. If air power is as effective on the Germans as it seems to be on us, why aren't we in Berlin?'"[5]

The result of this episode was a letter written by Bradley to all his commanders stating in no uncertain terms that they could not expect to go through the war immune to attack from the German air force. That lesson is as applicable today as it was in 1944.

The Contemporary Order of Battle. A glance at *The Military Balance*, the acknowledged neutral source of net assessments, reveals the naïveté of the "never more than six feet off the ground" view.[6] You cannot ignore 1,572 Soviet long- and medium-range bombers and 2,655 ground attack fighters, nor 1,380 post-INF (intermediate-range nuclear forces) Treaty tactical ballistic missile launchers (TBMs) or the helicopter threat of 1,500 gunships. The TBM threat is increasingly worrisome because of a reduction in circular error probability and the possible introduction of fuel air explosive (FAE) warheads that have the destruction potential of low-yield nuclear weapons.[7]

Joshua Epstein, currently a defense analyst with the Brookings Institution, has written an interesting treatment titled, *Measuring Military Power: The Soviet Air Threat to Europe*.[8] He attempts to show how "bean counting"—the net assessment of military forces—should be shaped by performance factors. The subject of the analysis is the probability of a successful Soviet frontal aviation offensive directed against NATO command and control centers, air bases, tactical nuclear weapons and ADA sites. By inputting various arcane factors such as sortie rates, the target set and the number of munitions required to destroy each target (222 for an air base, for example), Epstein concludes that Soviet frontal aviation would cease to exist after the 13th sortie and fall far short of the air offensive objectives. While one can dispute the factors used, many of which are based on dated, unclassified sources, the computer simulation's conclusion that 1,109 ground attack aircraft would successfully deliver

7,206 munitions is an eyeopener. Such a blow would not necessitate NATO's capitulation, but in the era of cluster munitions, the ensuing damage could be devastating. It is precisely this sort of threat US ground forces have never faced, and ADA strives to prevent.

A lesson of the 1980s that has been hard to accept is the spread of military technology to lesser-developed countries. This point was brought home by the sinking of the HMS *Sheffield* by an Argentinian Exocet missile and reinforced by the Iraqi use of the same weapon against the USS *Stark*. Employment of US forces anywhere in the world, even in low-intensity context, must take the potential air threat of nations other than the Soviet Union into consideration.

More ominous was the role of TBMs in the Iran-Iraq War and their potential marriage with chemical or FAE warheads, a key concern of *Desert Shield* planners. These weapons are proliferating throughout the Third World and make the limited antitactical ballistic missile capability of Patriot even more important. It is heartening that the Panama intervention, the Grenada rescue mission and the show of force in Honduras included Stinger gunners in the force package and that significant ADA assets were in the vanguard of *Desert Shield* deployment. Given the potential air threat, it is clear that ADA units must be part of the bedrock of any future employment of US ground forces.

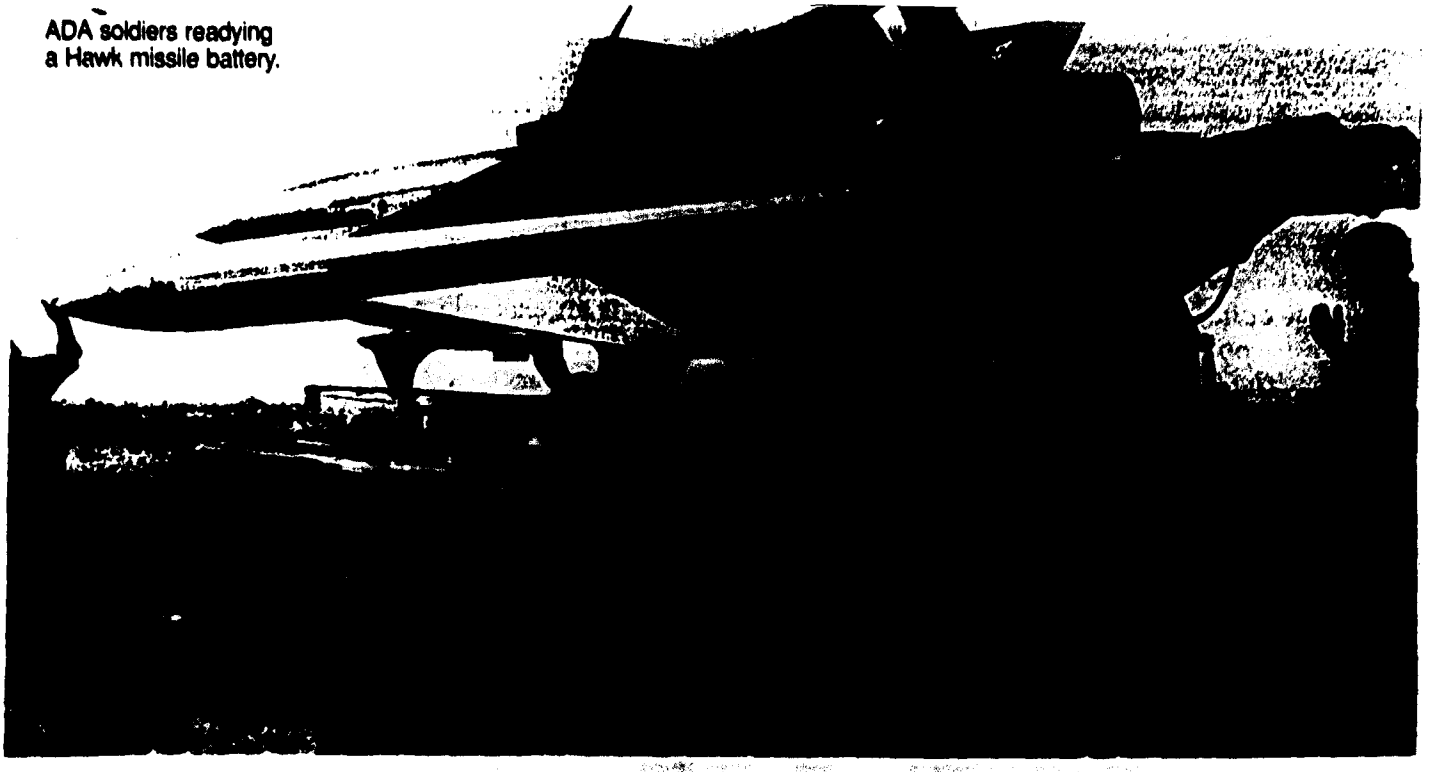
ADA's NTC Experience. As previously noted, the Army's capstone how-to-fight manual, FM 100—5, declares that the air in AirLand Battle is as important as the land fight for the ultimate success of the ground campaign. The manual's introduction goes on to note that the enemy can be expected to contest use of the air space, and future mid- to high-level conflict will be characterized by large quantities of lethal weapons systems, many of which will operate in the air.

The acknowledged proving ground, where AirLand Battle theory is validated is the NTC. It is here that ADA is gaining acceptance of its place on the combined arms team by contributing to maneuver unit success in a threat environment rich in aerial weapons systems. Lieutenant Colonel James McDonough, author of the highly acclaimed *Platoon Leader*, has focused his literary talent on his numerous NTC experiences. The result is a very entertaining, yet instructive, allegorical text in the manner of the military classic, *The Defence of Duffer's Drift*. One of the first lessons the protagonist learns on his path to eventual success is the necessity of integrating air defense into the overall unit plan. It is a lesson for the Army as a whole.

The primary NTC focus is on the combined arms task force. Placing theory into operations and testing that function by the closest replication of combat possible is done very well. The opposing force (OPFOR) has the well-earned reputation of being the best-trained Soviet force in the world. The "fog of war" is omnipresent and quickly reinforced by the observer/controllers; venturing into one's own minefield is quickly pointed out by a burst from the controller's "kill gun." Yet, there are elements of the modern battlefield that are simulated or inaccurately represented. Air operations is one.

Both forces have close air support, but with only the Stingers and Vulcans of the task force and SAM-7 replicas of the OPFOR present, aircraft can operate with impunity until they reach the main battle area. Early warning is a critical, but often overlooked, element of modern warfare. Perfect information can be issued from the NTC "Star Wars" operations center, but this eliminates the fog of war facets such as equipment malfunction and human misinterpretation. The presence of supplementary ADA weapons, warts and all, provides a closer representation of the modern battlefield.

The introduction of Hawk and Chaparral systems to the NTC had a dramatic impact. The F-16s supporting the OPFOR no longer had free run of the Blue (US or friendly) area of operations. Once they were intercepted at medium altitude, far from the forces they were to support, the "enemy" F-16s resorted to low-level approaches that increased the effectiveness of the task force ADA weapons and lessened the F-16s' accuracy. The same effect was noted



ADA soldiers readying a Hawk missile battery.

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when Chaparrals were added to the OPFOR columns and took a toll of A–10s supporting the Blue forces. It is a historical truism that close air support efficiency drops in proportion to the amount of ground–based fire it receives; the 1972 introduction of the SA–7 (man–portable antiaircraft missile) to Vietnam and the Stinger success in Afghanistan are two good examples.[9]

Air defense includes all measures, active and passive, taken to preclude or lessen the effectiveness of air attack. Ample early warning permits friendly forces to employ passive actions such as dispersal, hasty camouflage and enforcement of light discipline. It also allows a maximum number of ADA weapons to be cued to the impending air threat, as well as all other sources of firepower. NTC early warning has best been accomplished by positioning a divisional ADA officer in the Hawk platoon command post. He can then broadcast directly over a closely monitored net. Like many NTC lessons, it often takes an air strike like that which devastated the aforementioned division support area before the warning is heeded.

Air parity and limited air superiority at a chosen time and place are important ingredients of AirLand Battle doctrine. Without this precondition, the modern task force will face the same fate as the doomed units of Mortain, Guadalajara and the Mitla Pass. Initiative and agility, two FM 100—5 tenets, require freedom from air attack. Units employing these attributes at the NTC, like the 1940 panzer armies racing across France, have fared well. But NTC experience has shown current ADA weapons systems have difficulty in this respect. The Vulcans mounted on M113 chassis cannot keep up with Bradley infantry fighting vehicles and Abrams tanks. Stinger teams in their organic HMMVs (high mobility multipurpose vehicles) have the same problem in off–road terrain and are vulnerabe to artillery fire. NTC controllers arbitrarily "kill off" wheeled vehicles. Task forces have responded by placing Stinger teams in organic armored vehicles thereby preserving this important asset, but at the expense of prepositioning,

Just as we place great emphasis on interdiction against succeeding echelons and logistic activities, so do our potential adversaries. Supply trains at the NTC were mercilessly pounded by air attacks. Commanders were forced to choose between lessening Stinger coverage for forward "teeth" to losing their logistic "tail."

early engagement and recovery of the Stinger team once employed. Regardless of the veracity of HMMV vulnerability, it points out the need of the Air Defense Antitank system under development. Until the Linebacker, as it has been nicknamed, is fielded, commanders must be cognizant of the shortcomings of current systems.

An important FM 100—5 theme is that of fighting throughout the depth of the entire battlefield. Just as we place great emphasis on interdiction against succeeding echelons and logistic activities, so do our potential adversaries. Supply trains at the NTC were mercilessly pounded by air attacks. Commanders were forced to choose between lessening Stinger coverage for forward "teeth" to losing their logistic "tail." The introduction of Chaparral changed all that. It is an ideal weapon for point defense of static assets such as supply trains and route choke points and has been successfully used in this mode at the NTC. While it is true that division commanders cannot automatically expect such corps asset assistance, it is an option for the corps commander. A unit mounting an attack is an example where concentration of Stingers forward might necessitate Chaparral coverage of the rear area. NTC experience has also shown the infrared vision feature of the improved Chaparral to be an excellent impromptu ground surveillance system. Both airmobile insertions and ground infiltrations have been halted by this rear area capability.

Lessons From the Past, Warning For the Future. The Combat Studies Institute of the Command and General Staff College, Fort Leavenworth, Kansas, commissioned a group of military historians to assess the Army's performance in the first battles of our nation's wars. The scoreboard is not encouraging. Five of the 10 battles ended in defeat; four of the victories were nearly Pyrrhic in costliness.[10] A pattern of preparing for the last war is apparent. Given the Army's dearth of historical experience with air threat–capable foes, this could be fatal. We must rely on the NTC evidence of ADA's place on the combined arms team, or we risk the disaster of a Task Force *Smith*, which was unable to deal with the technological surprise of the potent North Korean tank threat.

It is clear that ADA must be first to fire, if we are to win the first battle of the next war. Air defense units have shown at the NTC that they can contribute to that goal. If we are overwhelmed from the air, the chances that we will achieve victory are very slim indeed. ***MR***

NOTES

1 Department of Defense News Clips ·Washington DC 24 September 1987)
2 Cornelius Ryan, *The Longest Day* (New York Simon and Schuster, 1959) 270–72
3 Martin Blumenson, *Breakout and Pursuit* (Washington DC Office of the Chief of Military History 1961), 33
4 Ibid., 356
5 Quesada Oral History Archives Section, Military History Institute Carlisle Barracks, PA
6 *The Military Balance 1989–90* (London International Institute of Strategic Studies, 1989)
7 David Clemons, *Soviet Warsaw Pact Operations During the Initial Period of War* (McDonnell–Douglas Corporation, 1988)
8 Joshua Epstein, *Measuring Military Power The Soviet Air Threat to Europe* (Princeton, NJ Princeton University Press, 1984)
9 For an excellent examination of this point, as well as close air support in general, see Richard P. Hallion, *Strike from the Sky* (Washington, DC: Smithsonian Institution Press, 1989)
10 John Shy, *America's First Battles*, ed Charles Heller and William Stofft, (Lawrence, KS University of Kansas Press, 1986), 329

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MR REVIEW ESSAY

World War II Desert Warfare

By Lieutenant Colonel Cole C. Kingseed, US Army

THE CRUCIBLE OF WAR: Western Desert 1941 by Barrie Pitt. 528 pages. Paragon House Publishers, New York. 1989. $24.95.

THE YEAR OF ALAMEIN 1942: The Crucible of War, Volume 2, by Barrie Pitt. 504 pages. Paragon House Publishers, New York. 1990. $24.95.

Few battles in World War II proved as decisive as the Battle of El Alamein, the monumental struggle that occurred in the North African Western Desert from October to November 1942. The British victory not only ended the Axis threat to the Suez Canal and the western approaches to the Middle East oil fields but also led to the destruction of Erwin Rommel's fabled *Afrika Korps* in Tunisia six months later.

Until recently, the war in the Western Desert has not received the scholarly attention in US publications it deserves, but the publication of the first US edition of former British officer Barrie Pitt's *The Crucible of War*, a two-volume series published in England in 1980 and 1982, rectifies this obvious gap in the historiography of this century's greatest conflict. Pitt's highly acclaimed study is likely to become the definitive history of the British campaign in North Africa. Using unit accounts, unpublished manuscripts and recently declassified interviews with British and German officers, Pitt, himself a veteran of the campaign, weaves a provocative story of the struggle that captivated British attention during the period 1940 to 1943. The net result is the finest history of the Western Desert war yet written.

The Crucible of War: Western Desert 1941 focuses on Lieutenant General Archibald P. Wavell's and General Claude J. Auchinleck's commands (June 1940 to December 1941) and sets the stage for the pivotal Battle of El Alamein in Egypt the following year. Pitt begins his analysis by examining the geographic conditions of the Western Desert and the armies that fought there. He describes the desert as a tactician's paradise but a quartermaster's hell.

Renowned Western historian John Keegan summarizes conditions for combatants in this area of operations in another way. He describes Rommel's plight as "a prisoner of the geographical and territorial determinants of the desert campaign: the desert yielded nothing, and over long stretches the landward edge of the coastal plain was bounded by high ground or a steep depression, effectively confining the movement of the armies to a strip forty or fewer miles wide. In that strip, . . . the chain of small ports were the only, but essential, points of military value. Campaigning necessarily took the form, therefore, of a dash from one point of maritime resupply to the next, in the hope that its impetus would topple the enemy off balance and allow his destruction when he was bereft of water, fuel, ammunition, food and reinforcements—the essentials, in that order, of desert warfare."[1]

Into this barren wasteland entered the Italian army in 1940. Already a veteran of the war in Africa, the Italian army was in no condition to fight a major war abroad. Foolishly crossing the Libyan–Egyptian border in September 1940, it met a few minor successes before Wavell, the British commander in chief, Middle East, counterattacked and essentially destroyed the Italian force. Wavell, whom Pitt characterized as "quick footed, quick minded, and . . . light hearted," never received the total support of Prime Minister Winston Churchill. In Wavell's own words, Churchill demonstrated repeatedly that he "did not trust me to run my own show and was set on his [Churchill's] ideas."[2] Despite Churchill's apparent lack of confidence in him, Wavell balanced the campaign in North Africa with his reserves allocated to campaigns in Somaliland, Syria and the Sudan, producing Britain's first victories in the western Desert war.

Just as British fortunes shone brightest, however, Rommel ("the Desert Fox") arrived in Africa on 12 February 1941 with the advance elements of what would become *Panzergruppe Afrika*. Never conceived by Adolph Hitler to be anything more than a side show to his upcoming invasion of the Soviet Union, the Western Desert war achieved greater significance as Rommel characteristically seized the initiative. Totally disgusted with the sluggishness of the Italian command, Rommel disregarded his order to confine himself to reconnaissance and launched a major offensive.

Like many British veterans of the Western Desert war, Pitt maintains healthy respect for the Desert Fox and the unorthodox tactics he employed to keep his opponents at bay for two years. When Rommel arrived in Africa, he immediately encountered opposition to any type of offensive operations from senior military officers. The Italian high command advised him that an offensive was the best way to lose both his reputation and his honor.[3] Soon even the German General Staff sought to control "this soldier gone stark mad."[4] Yet, Rommel [illegible] sped the opportunities the desert offered as well as the constraints it imposed, perhaps [illegible] than any other combatant in the Western [illegible]

Although he had no experience in desert warfare, he understood mobile warfare and combined arms. In Rommel's mind, the proper use of armor was not to fight armor, but to discover weak points in the enemy's defense and then attack soft-skinned targets in the rear. Artillery was to fight tanks; infantry was to capture artillery posts. Rommel also understood that it was often possible to decide the issue of a battle by merely making an unexpected shift of one's main effort. Rommel's timing in executing this shift of momentum gave birth to the "Rommel touch" and enhanced the growing legend of the Desert Fox. Using such innovative tactics and charismatic leadership, Rommel reinforced his reputation as one of Germany's premier field commanders.

Following Wavell's defeat in Operation *Battleaxe* in June 1941, Auchinleck assumed command of the British forces in the African theater. Pressured by Churchill into an offensive, Auchinleck successfully drove Rommel back, but lost 500 tanks in the process. Rommel could have easily quoted Arthur Wellesley, the Duke of Wellington, who said a century earlier, "They came at us in the same old way, we stopped them in the same old way." Yet the combination of the Royal Air Force and the Royal Navy, together with Auchinleck's offensive, had been too much for even Rommel to withstand until his own logistic tail shortened and became more manageable.

By early 1942, the front had once again stabilized, but a mood of frustration engulfed the Eighth Army, now the principal British force in the desert. Their high command was dispirited, and all indications were that Rommel intended to renew the offensive. But, there was a silver lining. The United States had entered the war and its huge technological and economic resources made an immediate impact as the first US tanks began arriving in the Mediterranean Theater.

Reading ULTRA messages, Auchinleck was well aware that Rommel was preparing a major offensive, but unfortunately ULTRA did not reveal Rommel's tactical plans because they were not subject to cables between Berlin, Germany and Tripoli, Libya. In addition, Churchill shifted much needed reinforcements to other areas within the Mediterranean to bolster the Allies and offset German gains, causing the British to delay their own offensive against Rommel. On 26 May 1942, the *Afrika Korps* characteristically attacked first with Rommel in the lead. Although he suffered high losses, Rommel reasserted his dominance on the battlefield during the campaign (that Pitt argues represented the nadir of British generalship during the Western Desert war). By 21 June 1942, Rommel captured Tobruk, Libya, and within a week he crossed the Egyptian frontier. Finally, at a small railway station in El Alamein, his offensive ran out of steam as British defenses stiffened.

After a month of continuous defeats, Churchill finally had enough. According to the author, the prime minister's reactions to the events of June varied between violent anger and brooding melancholy. Consequently, he decided that victory could not be won without a change in command. Following the unexpected death of Lieutenant General "Stafer" Gott, commander of the Eighth Army's XIII Corps, Churchill selected General Bernard L. Montgomery to command Eighth Army.

American readers, long enamored with Dwight D. Eisenhower and George S. Patton Jr., may find it difficult to understand the charismatic leadership style that Montgomery possessed. During the two months between his assumption of command and the commencement of the Battle of El Alamein, Montgomery transformed Eighth Army. Speaking to every formation, he restored confidence by stating, "If we cannot stay here alive, then let us stay here dead." Said one regimental sergeant major, "He told us everything, what his plan was for the battle, what he wanted the regiments to do, what he wanted me to do. And we will do it, sir. What a man!"[5]

By early October, Montgomery had finalized plans for his offensive. Aided by the addition of 300 recently arrived Sherman tanks, he attacked behind a barrage of 882 field and medium guns on 23 October 1942. It was a classic battle of attrition, a World War I battle fought with World War II weapons. The colossal struggle raged until 3 November 1942, when Rommel finally withdrew to the west.

German and Italian losses were catastrophic: 50 percent of Rommel's infantry, 40 percent of his ar-

tillery and all but 24 of his panzers were lost. Montgomery's losses, 13,500 killed or wounded, were numerically higher, but Rommel's losses were proportionately greater; thus, the tide of victory clearly turned in favor of Montgomery and Eighth Army.

In summary, Pitt has made a monumental contribution to the historiography of World War II. Although a Britisher who relies almost exclusively on British sources, his account of the Western Desert war is surprisingly balanced. Perhaps better than any other historian, the author places the *Afrika Korps*–Eighth Army struggle in the overall context of the Mediterranean Theater of Operations. Few military historians present such detailed accounts of the operational and tactical levels of war as does Pitt. His analysis of commanders and the rationale for their decisions makes *The Crucible of War* mandatory reading for all serious students of World War II and those interested in desert warfare. ***MR***

NOTES

1. John Keegan, *The Second World War* (New York: Viking Press, 1990),329.
2. Barne Pitt, *The Crucible of War* (New York: Paragon House, 1989), 64
3. Ibid., 241.
4. Ibid., 275.
5. Barne Pitt, *The Year of Alamein 1942* (New York: Paragon House, 1990), 217.

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MR INSIGHTS

Dynamic Management of US Army Doctrine

By Lieutenant Colonel Jack Burkett, US Army

In the US Army today, changes in all areas are inevitable. To take advantage of changes, deal with them effectively and capitalize on their positive aspects, we must address the continuing problem of maintaining the currency of our on-hand and emerging doctrinal products. Each doctrinal manual has a tremendous impact on force design, equipment development and procurement programs, and training strategies for the entire Army.

A comprehensive and easily understood program to manage changes in the Army is absolutely mandatory to the combat readiness of our units. But it is increasingly evident that a vital and key functional element is either missing or not being applied within the US Army Training and Doctrine Command (TRADOC) doctrinal literature system—integrating current, timely changes into Army doctrine.

Each year, the Army spends millions of dollars on separate and unrelated training exercises. Each of these exercises allows the unit to experience the most demanding and realistic training available at a training center or home station. These training activities take the following forms:

- "On the ground" maneuver at home station local training areas; the National Training Center, Fort Irwin, California; Joint Readiness Training Center, Little Rock Air Force Base and Fort Chaffee, Arkansas; and the Combat Maneuver Training Center, Hohenfelds, Federal Republic of Germany.
- The command seminars and *WARFIGHTER* exercises of the Battle Command Training Program (BCTP), Fort Leavenworth, Kansas; the Warrior Prep Center, Ramstein US Air Base, Federal Republic of Germany; and evolving corps simulation centers.
- TRADOC branch schools pre-command courses (PCCs) and the US Army

The common thread throughout these training events is the units' desire to use the most current doctrinal and training publications available. To improve the quality and value of current and future training events, much effort and money is spent collecting "lessons learned" and insights throughout the spectrum of Army training activities. Individually, our combat training centers and major training activities are excellent forums for the conduct of training at each echelon. But are the Army and the taxpayer receiving the maximum benefit from the training received and money spent? It is highly probable that they are not because our doctrinal and training products are not properly maintained with the most up-to-date tactics, techniques and

procedures (TTP).

General Carl E. Vuono, chief of staff of the US Army, addressed this issue with the following statement: "We must continue to investigate ways to extract every ounce of training we can achieve from each dollar spent." TRADOC places the action of integrating TTP into Army doctrine as the number two priority of the top 10 TRADOC initiatives for Fiscal Years 1989 through 1991. Current and timely innovations, insights and lessons learned provided to the field will not only contribute to an overall increase in the Total Army's training and readiness but also serve to maximize the dollars we spend on training.

Some insights and observations of the system within which we work may explain part of the overall problem and set the stage for proposed solutions. Under the doctrinal development process, it has taken 10 years to develop and publish an approved division-level doctrinal manual and 16 years for a corps-level manual. The reasons for these extreme time-lags are varied, but interrelated.

At its best, the doctrinal literature development process is complex and cumbersome. It is staffed with a bureaucracy of both experienced and inexperienced active duty and Department of Army civilian (DAC) personnel. TRADOC's normal method of assigning doctrine developers and writers at each military installation involves the designation of personnel based on availability, rather than on their practical experience. It realistically takes six to eight months for subject-matter experienced officers to become familiar with the doctrinal development process and system. It takes longer for an inexperienced person.

In a normal three- or four-year tour, for example, an officer will spend two years in a branch assignment such as student or instructor at USACGSC or on a battalion/brigade staff. The officer would then be assigned as a doctrinal developer/writer. With only two years remaining of the tour and using a conservative six to nine months' train-up period to become productive, the officer has less than one and a half years to produce an approved document. The reality is that most experienced doctrine writers "bail out" as soon as they can to get back to troops to remain competitive for promotion. The doctrinal development process does not factor in this career management mandate for promotion survival

It is supposed to take 12 months to develop a doctrinal product from a clean sheet of paper, but the established norm is closer to 18 to 21 months. With changing mission priorities, administrative action officer duties and personnel turbulence, the document is rarely completed by the originating author. The process becomes more complex and time-consuming with the assignment of a new author/officer replacement and the changes that the new author will invariably want to make ("We did not do it that way in my unit").

The system does not readily accept change in any form. A new author or supervisor who was not available to receive the original guidance merely delays the process and all subsequent time lines with changes that do it "his (or her) way." The original intent and focus of a manual is extremely difficult to maintain within the present personnel assignment system. The lack of continuity of personnel and accompanying experience is debilitating to the entire doctrinal development process. Longevity and experience are key factors and are absolutely essential to make the system work.

Additionally, the doctrinal development program requires a revision of each doctrinal product approximately every five years. This revision is almost always not accomplished by the original author or authors and normally becomes a completely new product starting at the beginning of the republishing process. The reasons for a new start-up are primarily tied to new equipment, training innovations, lessons learned and new or revised guidance. What should be a simple process of applying changes to the original document requires another two years (minimum) for development of a completely new document. Once behind schedule, the publication stays behind until the responsible organization makes a concerted effort in personnel and resources to publish the book at the expense of other important missions, as USACGSC did with US Army Field Manual (FM) 100—15, *Corps Operations*, and FM 71—100, *Division Operations*.

The Army is now at a critical point in the doctrinal development process. Several capstone documents are being produced, approved and distributed to the field. The key ones are FM 100—15; FM 71—100; FM 71—3, *Armored and Mechanized Infantry Brigade*; FM 71—2, *The Tank and Mechanized Infantry Battalion Task Force*; FM 25—100, *Training The Force*; FM 7—10, *The Infantry Company*; FM 7—20, *The Infantry Battalion*; FM 7—30, *The Infantry Brigade*; and the mission training plans and associated "how to" books accompanying them.

These documents provide trainers and instructors with a sound base of "best available" current knowledge from which they can move forward to improve the readiness posture of each unit. Continued forward movement requires that we constantly monitor training activities and analyze the

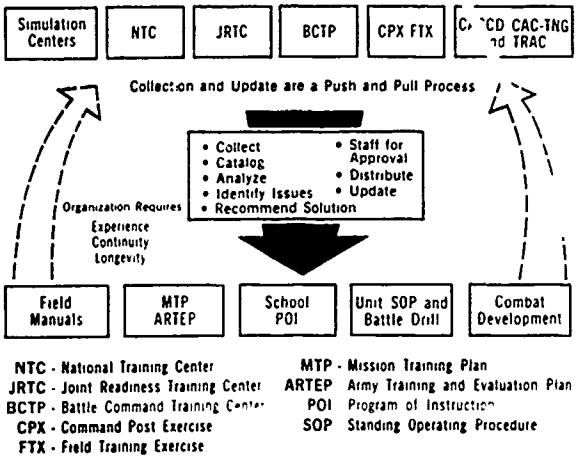

Figure 1. Doctrinal maintenance cycle

data produced to identify and change those tactics and techniques that prove to be inappropriate for the echelon or unit concerned. We must now address our long-range doctrinal objectives and develop a program that maintains approved documents and provides timely feedback to the units.

Numerous changes to our doctrinal training and TTP literature will soon be required by existing and future systems, organizations and training lessons learned. Figure 1 illustrates a concept of the interrelationship of training activities and doctrinal training products. Current training activities produce volumes of real-world issues.

US Army Combined Arms Command Combat Developments (CACCD), Fort Leavenworth, Kansas, with its study of the issues of close combat-heavy, close combat-light and command, control, communications and automation, can identify and recommend fixes to major issues but normally does not produce analyzed data that can be converted into timely changes to training and doctrinal manuals for dissemination to the field. The Center for Army Lessons Learned, Combined Arms Command-Training (CAC-TNG), Fort Leavenworth, Kansas, does a superb job of collecting training observations and disseminating them in their lessons learned publications. However, integration of this information into doctrinal publications as an institutional change for the Army as a whole is generally lacking. There presently is no organization capable of analyzing all data provided for application to the echelon for which it is intended. To date, no formal program or responsible agency completes that next step with insights and lessons learned and identifies required doctrinal and training changes and recycles those changes back into the approved doctrinal and training manuals.

A solution to the problem described would be the establishment of an organization or team with the primary mission of maintaining the currentness of approved doctrinal, training and TTP literature. This organization would serve as a central repository and conduit for analysis and distribution of lessons learned, observations and insights for all echelons, as well as systems and functional areas. It would complement the efforts of current and future Combined Arms Command, Fort Leavenworth, Kansas, and TRADOC agencies, to include US Army TRADOC Analysis Command (TRAC), also at Leavenworth.

Figure 2 reflects a concept for the collection, storage, analysis and dissemination of insights and lessons learned. The collect data and input is categorized by each tactical echelon (squad to corps) and battlefield operating system, and supporting systems and functions within that echelon. This systems approach provides the capability to absorb and process large amounts of data and to identify those valid issues that require resolution and doctrinal change. This organization would substantiate the issue to the approving chain of command with on-file observation reports and records, analyze the issue, propose doctrinal solutions and conduct formal TRADOC staffing to obtain approval. Once the proposed change is approved, the final product would then be provided to the Concepts and Doctrine Directorate (CDD), USACGSC, for printing and worldwide distribution. The collection of data by this organization must be a "push-and-pull"

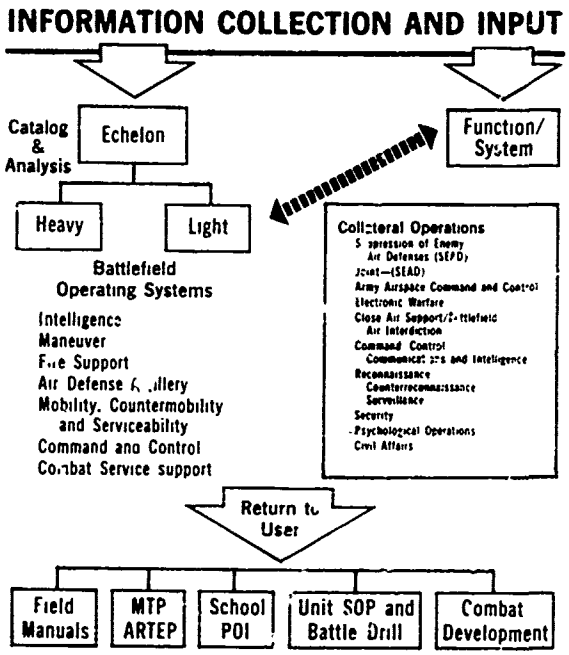

Figure 2

process. The organization would actively pursue information by observing training events on a regular basis, as well as obtain access to the distribution of training reports throughout the Army.

The key to this concept is the acquisition and retention of experienced doctrine writers for continuity and consistency of effort over a long term. The capability to expand the organization's charter can occur, if required, as TRADOC centers and proponent schools produce approved manuals and elect to pass along the maintenance requirement. The organization should ideally be located in CAC–TNG where the bulk of the training observation and collection effort exists. It should maintain close working relations with the CDD, doctrine developers and integrators, and CACCD force designers so the organization can maintain access to current doctrinal force structure problems and issues.

There are three possible options available:

- Selectively identify and bring together to the organization a team of doctrinally experienced active duty service members. Experienced personnel in the doctrinal arena will produce a quality maintenance effort. Personnel turbulence and mission priority changes, however, will remain a factor and affect any effort to promote continuity and longevity.
- Hire doctrinally experienced DACs into the organization. This option will provide experience, as well as continuity and longevity. The DA system, however, is still bound to the mission priorities of the military structure it supports. It would be difficult for this option to maintain a continuous and focused effort on only one mission priority without a resulting dilution of the main effort.
- Solicit a contract to provide doctrinally experienced personnel to accomplish the mission for an extended term. The doctrinal and training interface with contractors is already established through current and projected training activities. This option provides an organization that is not necessarily responsive to the everyday changing priorities of the military structure it is contracted to support. A contractor-supported organization can remain focused on the mission with personnel who are experienced for the long term.

In summary, the Army needs a usable system that will dynamically manage the changes that will be created by evolving technologies, innovative training strategies and the initiative of the Army soldier to overcome training and doctrinal voids. Change, if properly managed, is good for all. If not properly managed, change will create confusion throughout the echelons of command, and our concepts of integration and synchronization of battlefield elements will never be realized in a training environment. ***MR***

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MR SUMMARIES

New Rules: Modern War and Military Professionalism

By A. J. Bacevich

December 1990, *Parameters*

A. J. Bacevich precedes his essay with a quote from J. F. C. Fuller, "We had made up our minds to play whist, and when we sat down we found that the game was poker." He then begins by saying, "Recent events have torn history from its moorings . . . the old rules no longer pertain; woe be to those who fail to take heed . . . the long, bloodless NATO campaign bids fair to culminate in a satisfactory resolution of the Cold War."

As for the US Army, "the blessings of success are proving to be mixed. Having prevailed, we now dismantle the instrument of victory." He allows that dismantling that instrument may "not show us at our most enlightened." He says "the officer corps confronts the challenge of grappling with that most elusive and complex subject—the future." And to do it, we should begin "with a clear head and an open mind."

Bacevich asserts that "American officers profess an interest in history but actually prefer heritage—prettified versions of the past designed to make us feel good: events as interpreted by the brush of

Don Stivers." He argues that General George S. Patton's triumphs "provide the model for what we tend to think of as 'real' war . . . [and that] this model has achieved an exalted status akin to an article of faith, off-limits to skeptical reexamination." He says, "The officer corps is quick to embrace . . . that the way we have envisioned warfare need not change."

The most recent offering of doctrine writers that shows "this predisposition to see the future as a linear extension of the past . . . [is] known as Future Airland Battle," according to Bacevich. He maintains that Future Airland Battle "updates existing doctrine with . . . technological wonders—near-perfect intelligence and long-range precision weapons." Bacevich's opinion is that "rather than a blueprint for adapting to a changing world, Future Airland Battle testifies to our devotion to the status quo, our doggedness in clinging to the role we have insisted upon since Patton last led us to victory. Notwithstanding claims that it breaks new ground, Future Airland Battle is a sterile manifestation of nostalgia—a self-indulgence that the Army today can ill afford."

"For any army entering a new historical era, a commitment of principles derived from anything other than a detached, objective analysis of modern war—not war as we would *like* it to be—may . . . spell future defeat. Hence, the imperative at this moment in history is to challenge orthodoxy, to question institutional biases, even to risk a lapse of internal consensus if required to develop a cogent vision of the tasks ahead."

Bacevich credits German General Ludwig Beck as warning us that to develop this vision of future tasks, an officer corps cannot restrict itself to matters of craft but must "embrace a mature vision of professionalism, one skeptical of faddish checklists of tenets, imperatives, or operating systems that promise shortcuts to professional mastery."

Bacevich says, "Warfare adheres to a pattern," that future wars and skirmishes will "reflect the salient characteristics of wars in the recent past." Therefore, "a task of some urgency is for American soldiers to catch up on the insights and lessons derived from the last 40 years of conflict."

The foremost lesson concerns "the role of *the people* in warfare . . . They may be the medium within which conflict occurs; they may sustain the combatants or double as fighters themselves; or they may constitute a strategic objective whose support determines war's outcome—but almost without exception in modern wars, *the people* play an integral part." After several examples, Bacevich concludes "that to make war without the assurance of popular support is foolhardy in the extreme."

Bacevich writes that since World War II "the concept of 'total war' . . . has dominated our thinking." He projects that in the future "armies will employ force only in discrete amounts for specific, achievable purposes, with commanders held accountable for needless collateral damage; [and that] force will constitute only one venue among many that states will employ to achieve their aim." The other venues include "diplomacy, information policies, economic leverage."

The Army's task now becomes devising a new paradigm to supersede the concept of "total war," says Bacevich. He lists five challenges that we will face in doing this:

- "To grasp the extent to which global developments have rendered obsolete many of our customary routines and assumptions.
- "To be wary of our own selves—our penchant for nostalgia, our yearning to retain a distinct, elevated status in society—as obstacles to seeing war and its requirements objectively.
- "To recognize that war long ago outgrew the boundaries of traditional military craft and to expand our conception of professionalism accordingly.
- "To factor into any consideration of future wars the involvement of civilian populations—ours, the enemy's, and those of non-belligerents who nonetheless are more than mere observers—as central to the definition of war aims, strategy, and the methods that soldiers will employ in accomplishing their mission.
- "To postulate a new theory of warfare deriving not simply from the limits of technological possibility but from the political and moral dictates of our age—dictates that can redefin themselves with disconcerting suddenness."

He continues by saying, "Whether the officer corps can find within itself the intellectual muscle and creativity required remains very much in doubt."

Why?

Because according to Bacevich, "American Army officers pride themselves on being doers rather than thinkers." Also, we have "come to rely on civilian defense intellectuals to guide our thinking about strategy and war. Since the 1950s at least, we have been *consumers* of ideas, conceding to others responsibility for *producing* them."—DGR

MR LETTERS

Modified "Conger Method"?

Lieutenant Colonel Harold R. Winton's otherwise excellent portion of the *Review Essay*, "The Fog of Military Education," in the January 1991 *Military Review* on Dr. Carol Reardon's book, Soldiers and Scholars, is marred by an excessive claim for the methodology of the School of Advanced Military Studies (SAMS). Dr. Winton claims that SAMS' instructional methodology is a "modified Conger method," a claim that will not stand scrutiny and which, were it offered as a recommendation for adoption, would probably not be accepted by the faculty of that school.

The SAMS' method that Winton describes fails to approximate to Conger's on two principal points. First, the central feature of Conger's method is that it was founded on detailed examination of primary sources. According to Reardon, the assumption upon which the "source [Winton's Conger] method" was founded was the idea that "officers who had reconstructed historical events from a voluminous documentary record [emphasis added] were far more likely to discern whether the information upon which they based their command decisions was incomplete or contradictory." Elsewhere Reardon writes, "The captain [Conger] then required his class to reconstruct the campaign for themselves from the original orders and after-action reports printed in the Official Records . . . " and indeed, "he would accept no arguments based on the 'everyday popular histories' that seemed to 'multiply like flies in a summer cavalry camp'." From this, it is clear that the use of primary source material was essential to Conger's method. It is not and has not been in SAMS' curriculum. SAMS students use good secondary sources that they discuss critically in terms of the theoretical concepts with which the course opens. This, of course, is the second problem with the analogy; for as Winton notes in the body of his text, Conger rejected the idea that placed theoretical propositions before history.

Now the intellectual counter to this last argument is that at SAMS the theoretical propositions are hypothetical, subject to disproof by comparison with empirical evidence as presented in the secondary sources examined in the study of campaigns and battles. This, indeed, is a valid way to proceed, but it requires a sophisticated instructor who understands the nature of historical evidence and has a sophisticated and philosophical turn of mind rather than a desire to cut through ambiguity to achieve facile generalization. I would suggest that there is little evidence over the years that SAMS seminar leaders, the key node in the educational chain, have been selected on the basis of such capability. Rather, the governing proposition at SAMS is that any officer whose operational talents have been demonstrated by selection for senior service college attendance carries in his knapsack sufficient common sense to guide the students through a very sophisticated course in theory, history and war gaming. This is quite different than Conger's view that the "study of history cannot be made profitable until the nature of history is understood . . . " Indeed, at one time, the common refrain at SAMS was "we aren't trying to make them historians!"

All this is not to say that Conger was correct and the leaders of the SAMS are wrong. The latter, after all, have established their schools' credentials through their graduates. The point here is that were Conger to try to sell his views on the role and use of history in officer education at SAMS today, he would most likely fail. The SAMS method is no more a modified Conger method than the M1 tank is a modified Stuart Tank, and to be clear, the contrast in views suggests a question that neither Reardon nor Winton have really addressed.

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Light Infantry is Too Light!

Since ancient days, light infantry has battled over terrain unsuitable for heavier troops, used its mobility to annoy and disorganize opposing formations and screened the main body from the enemy's own light forces. These battlefield functions remain relevant today and for the foreseeable future. I have no doubts concerning the bravery, professionalism or competence of the US Army's light forces, but they are still only auxiliaries (albeit vital ones) to the heavy maneuver elements.

A great deal of breath has been wasted and ink spilled over the last decade concerning the proper role of the light infantryman on the modern battle-

field. Tactical pundits extol the endless virtues of light infantry: easily deployable anywhere in the world; well suited for the demands of low- intensity conflict (LIC); stealthy; tailor-made for deep reconnaissance; highly motivated and superbly trained. Light infantry units were formed at all levels, from long-range surveillance detachments to complete divisions. In fact, the Army now boasts six divisions whose main combat power is embodied in the light infantryman, not counting the Ranger regiment or the Special Forces groups. In an effort to explain our nation's need for so many light infantrymen, elaborate new doctrines for the use of light infantry in combat appeared throughout the professional press, covering heavy-light operations, light-heavy operations, even brigade-size infiltrations.

It is this cavalryman's opinion that much of the recent literature exploring "new" roles for light infantry is misguided at best, and at worst, a reflection of a dangerous and parochial split widening in the ranks of the infantry branch. Light infantry has its uses, just as it has had for the last several millenniums, but the centerpiece of the US Army should remain the heavily armed, mechanized infantry.

It is true that the Army (or rather, its sister services) lacks the ability to project heavy forces quickly across the globe to deal with sudden crises. Light infantry, especially in the form of airborne troops, can be transported by air in fairly large numbers to deal with a wide range of contingencies. However, they can only be *effective* in a limited number of scenarios. In cases where the opposition is weak (such as in Grenada or Panama) or the objective is strictly limited (such as seizing an airhead or rescuing hostages), light forces are highly suitable. But the days of the mass airborne drop are over. The number of places in the world vulnerable to such an assault are dwindling rapidly. Many Third World nations possess large armored forces and modern air defense systems. Dropping paratroopers into such an environment, weeks from relief, would be a waste of some of our finest soldiers.

Even in situations where light infantry can be air transported into a secure environment, its utility is limited. Against a moderately large, well-trained and mechanized foe, it is of questionable value, except perhaps in the defense of a limited area of urban or rough terrain. If the enemy is weak or the purpose is merely to "show the flag" through the rapid deployment of ground troops, light infantry can be handy, but in those cases, we are better off relying on the services of the US Marine Corps for the bulk of the force. That is, after all, its historical mission.

In fact, having a large number of light divisions is a waste of limited resources. In a mid- to high-intensity environment, they are far too vulnerable, while in a low-intensity environment, we are unlikely to need more than a fraction of our present establishment. We must realize that against a rapidly arming Third World, our power projection capabilities are in relative decline. To improve them, we need to increase our ability to move heavy forces, not rely on fragile light divisions. It may be cheaper to deploy light forces, but then you get that for which you pay.

Another ballyhooed job for our light forces is taking care of that trendy new style of combat—LIC. LIC is the latest buzzword to suffer the attention of military-oriented "think tanks." Having gone through the "taffy-pull" of the professional press, LIC has become so malleable a term as to mean all things to all people. At the risk of sounding anachronistic, I *think* they are talking about guerrilla warfare. I will intentionally ignore "conflicts short of war" (a military term for peace), complex operations not generally requiring a lot of infantrymen, light or heavy. I will also pass over the sort of valuable unconventional warfare conducted by small groups of Special Forces and confine my remarks to military operations requiring firepower.

In classic guerrilla warfare à la Vietnam, I admit that light infantry units are better suited for the sort of dismounted or airmobile operations common in restricted terrain. Mechanized units simply cannot be (given limited training time) as proficient in these skills as light units. However, keeping a large force of light infantry in readiness for some future guerrilla war is a waste of scarce resources. It is doubtful that the United States will be involved in such a conflict in the foreseeable future. After all, LIC could also stand for "low importance conflict." Especially with the decline of the Soviet Union, it is hard to imagine a reason for dispatching significant forces to prop up the types of governments vulnerable to an insurgency. Finally, if the need should arise, mechanized infantry (though slightly less capable initially) could operate in the light mode, while still maintaining the Army's overall operational flexibility. This leads me to my final point.

In the far distant past, mounted infantrymen existed who could ride rapidly to the site of battle, dismount and generally get soundly thrashed by the opposition. While useful in some instances, they never really caught on because they were the worst of two worlds. They lacked the shock value of regular cavalry, while they also were deficient in firepower as compared to the line infantry. Today, our mechanized infantrymen also ride to battle and dismount to fight. But, now there is a difference. Today's new mechanized infantryman can carry as

much, or more, firepower and ammunition as his straight "leg" counterpart, while the infantry fighting vehicle (IFV) allows him to employ shock and mobility on the battlefield. Infantrymen have never been more capable.

Unfortunately, they have been hamstrung by an infantry branch that seems unable to shake loose from the past. Many infantry officers seem to shun mechanized assignments, wrapped up in the mystique of the light infantry. Now, as a cavalryman I can sympathize with mystique, but my branch gave up horses long ago, and it is time the infantry relegated the light forces to their proper role. To do this, infantry leaders must face three stern realities:

- The mechanized infantry squad is too small. With three crewmen manning the Bradley, and given normal personnel shortages and casualties, today's average squad usually dismounts three or four. As a tank heavy team commander, I often had more vehicles in the company than I had dismounted infantrymen. Let us disband some of those light divisions and put more infantrymen where they can do the most good—in IFVs.
- There is little on the modern battlefield that a mechanized infantryman cannot do as well, or better, than his light counterpart. He has greater mobility, more firepower, more staying power, more armor protection, and he can still dismount and dig the other fellow out of his foxhole. The heavy infantryman is better able to employ the technological or materiel superiority that we traditionally rely on for victory. The "bottom line" is that in modern mobile warfare, leg infantry will get killed or left behind.
- Attempts to doctrinally justify our overinvestment in light infantry are reminiscent of the old arguments to retain horse cavalry. There will always be a role for long-range surveillance detachments, Ranger battalions, air assault and airborne units and the like, but most of the ideas for using light infantry in high-intensity conflicts are convoluted attempts to rationalize our inflated light infantry establishment. Schemes for using Bradleys from one battalion to ferry around light infantrymen from another, infiltrating brigade-size units by squads or bouncing large-scale airmobile formations around a lethal battlefield look great on paper. I am convinced, however, that they would be unworkable or extremely costly in wartime. I am also very skeptical of using exercises such as *REFORGER* or *TEAM SPIRIT* to validate some of these concepts. Having participated in them from the ground level, I know that placing faith in their tactical reality is so much wishful thinking.

It is time for the infantry to abandon its infatuation with the glamour of light fighting and lavish the same attention and resources on the backbone of the Army—the mechanized foot soldier.

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ROTC Develops 16 Dimensions of Leadership

In his Insight article, "Reinventing US Army ROTC: A Proposal for Reform," November 1990 *Military Review*, Captain Stephen C. Danckert both lauds and criticizes the US Army Reserve Officers' Training Corps (ROTC) program. While he points to ROTC's many successes and the current favorable attention it enjoys, Danckert also points to weaknesses he perceives in its implementation. In the latter regard, Danckert's criticism is less a specific condemnation of Army ROTC than a generalized swipe at American higher education. I would point out that metonymy will not do when one is proposing reform. That is, you cannot necessarily change the thrust of a larger institution by modifying a microcosm (Army ROTC) of that institution. Moreover, a somewhat dated understanding of the current Army ROTC program is a tenuous touchstone for reform.

The formulation and strength of the Army ROTC program is in the triad of Military Qualification Standards I (MQS I), Cadet Command's Leadership Assessment Program (LAP) and the milieu of intellectual humanism of the American university or college. When a cadet has successfully met the specific requirements of each part of the triad, he or she will be ready to enter the profession of arms and begin a career of service to the nation.

MQS I is the Army's standardized training program for all precommissioning training sources. It specifically prescribes requirements for leader development. Its two components—military tasks and knowledge and professional military education—form the basis of a leader development system that extends throughout an officer's career. The priority in precommissioning training is to ensure that each cadet can command and lead and to model the officer behavior associated with leadership.

Cadet Command's LAP, now the basis for the Army's Leadership Assessment and Development Program (LADP), is the common denominator for all ROTC training. Systematically developed, modified and executed since 1983, this technology focuses on developing 16 specific dimensions of leadership in individual cadets during their entire

tenure in ROTC training, in order to assess their ability to command and lead soldiers.

LAP is the standardized leader development technology in cadet commands that is employed on all campuses and at each summer camp. Its focus is always on the individual cadet; with precise developmental feedback as the constant means to cadet leadership growth. Each cadet, whether on campus or at advanced camp, is afforded multiple prespecified leadership opportunities, where leadership performance is assessed and developed in great detail. The key to the process is trained assessors. Each ROTC cadre member is trained in the leadership assessment technology at the School of Cadet Command, US Army Training and Doctrine Command (TRADOC), Fort Monroe, Virginia, before going to his or her assignment, in internal campus cadre training programs and again in precamp refresher training. By the time cadets are commissioned, trained ROTC cadet command assessors will have specified that the cadets have been fully assessed and are qualified to command and lead our soldiers.

The value of the LAP cannot be overstated. Its early success was briefed to the chief of staff of the Army through the Leader Development Study, and Cadet Command provided expertise through the Center for Army Leadership, US Army Command and General Staff College, Fort Leavenworth, Kansas, to integrate the technology into other precommissioning sources, and TRADOC officer, warrant officer and noncommissioned leader development courses. Cadet Command's LAP has become, in the larger sense, the Army's LADP.

Finally, the university or college provides the backdrop for full intellectual and moral growth. Cadet Command will not mandate, as Danckert suggests, either specific courses, disciplines or community service programs for its cadets. Danckert himself is proof of the soundness of that decision. After all, he was not forced into history, or theology, or philosophy; he obviously *took it upon himself* to find them and discover their power. He was not ordered into community service; he discovered the intrinsic value of man helping man. The individual does that, not a commander, or a program, or a discipline, or even a university or college. The individual does that. It is called *leadership development*.

Rather that lament "O *tempora! O mores!*," I would cite the 14th century scholar Thomas a Kempis in pointing to the Army ROTC program, "*Cum multa legeris et cognoveris, ad unum semper oportet redire principium*" (When you have read and learned many things, you ought always to return to the one principle). That principle for us and for our cadets is leadership development. It is implicit in Danckert's closing comment, "No Army is better than those who lead it." We believe it, we train for it and we will not sacrifice it.

Larry D. Brown, ***Headquarters, Cadet Command, US Army Training and Doctrine Command, Fort Monroe, Virginia***

Supreme Commanders *Don't* Always Wear Green

I read with tremendous interest Captain Mark D. Rendina's article, "An Officer Corps for the 1990's" in the October 1990 issue. Rendina's arguments are very cogent and timely. However, I have some observations to make.

Rendina stated, "Historically, it will be Army officers that will have overall command and responsibility for all combined arms committed to support its ground force. We need only to look at recent history to find examples. Supreme commanders wear green." Later he continued, the Army officer "must be prepared to exercise not only leadership over his own forces but overall command and control of the other services that support his troops in the field."

"The times, they are a changin," so goes the saying. While it is true that we can look back in our history to find green-suited supreme commanders, we can find equally capable supreme commanders wearing colors other than green. Admiral Chester W. Nimitz, US Navy, is just one good example. And while Operation *Just Cause* was commanded by General Maxwell R. Thurman, US Army, we should not forget that Operation *Urgent Fury* was commanded by the commander and chief of Atlantic Command (a three-star Navy admiral) and the joint task force commander was a three-star Navy admiral.

The recent Goldwaters-Nichols legislation concerning joint staff officers will help to institutionally change the way our joint commanders are selected down to task force level. The American people and the Congress will expect these commanders to readily understand the strengths and weaknesses of all the combat arms of all the services. This problem will not he limited to just Army officers. In the future, joint task force commanders and commanders in chief will likely be selected not on politics or the size of the preponderant force but on their demonstrated ability to control joint forces, a characteristic of which US Army officers do not have the monopoly.

Rendina's proposal has merit, not just for the Army but for all the services. However, the biggest

barriers to overcome will be institutional . . . how to implement this program without creating "an educationally elite" officer corps within the officer corps as a whole. As we begin to reduce the Armed Forces, as promotions slow down and the pportunities to command are reduced, Rendina's suggestions remind us of how the services managed the officer corps in the 1920s and 1930s.

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A Captured Soldier is a "Destroyed" Soldier

I disagree with Russell F. Weigley's contention in his September 1990 *Military Review* article, "From the Normandy Beaches to the Falaise–Argentine Pocket: A Critique of Allied Operational Planning in 1944," that a neglect of operational art resulting from an overemphasis on strategy and tactics in British and US military thought was responsible for inadequate and defective operational decisions during the Anglo–American campaign in France in 1944.

It seems to me that Weigley has not analyzed the possible ways in which operational art can be influenced, modeled and even created by military thought that does not itself deal directly with operational art and the ways in which military thinking can set the stage, so to speak, for military operations. In my opinion, the real root of the operational failures to grasp and exploit opportunities in France in 1944, particularly the much argued blunders that failed to promptly close the Falaise gap, is to be found in two shortcomings or flaws in military thinking, flaws whose rectification would have generated more effective operational decisions.

The first flaw was a lack of British and US doctrine regarding large encirclements (operations intended to cut off and entrap substantial bodies of enemy forces). Since Anglo–American military thinking ignored large encirclements as desirable objectives, it is not surprising that Anglo–American forces in the field did not give priority to encirclements and were not inclined to vigorously close the Falaise gap. Two other botched, half-hearted attempts at encirclements were the mid-September 1944 Mons Pocket operation, which allowed important German command elements to escape, and the potential long envelopment on the Seine River, which could have been more lucrative than the Falaise Pocket but was not achieved because of, among other factors, a failure to vigorously expand and use the bridgehead established at Mantes. The Germans and the Soviets in World War II, on the other hand, did appreciate large encirclements as important objectives, as the operations of both sides on the Eastern Front demonstrate.

The other significant defect in military thinking, one which ties in with the lack of appreciation of large encirclements, was too narrow an assumption of what it means to "destroy" the enemy's forces, by which "destruction" is equated with just killing the enemy. A broader and thus more inclusive consideration of destruction leads to the realization that, although war inevitably involves killing, an enemy soldier captured is just as destroyed as an enemy soldier killed. An enemy unit captured is just as destroyed, in the sense of being eliminated from the enemy's order of battle, as an enemy unit whose personnel have been killed, and often the unit is eliminated at less cost to one's own side than what killing would require.

The British and US armies went into World War II thinking of captives as incidental to victories or as the product of victories. The enemy is beaten by killing its soldiers, and after the enemy has been beaten, enemy soldiers who are still alive and have not run away become prisoners. The possibility of capturing the enemy was not considered as a high priority objective. Thus, it was probably inevitable that the Anglo–American forces failed to exert themselves to urgently close the Falaise gap. They simply were not predisposed to exploit the opportunity because of the negative influence of prior defective thinking.

Such false thinking that reduces war to one of its aspects—killing—fathered the prime strategic goal of Army Chief of Staff George C. Marshall and the man he chose to head operational planning for the War Department, General Dwight D. Eisenhower: Land US soldiers in France as soon as possible, preferably in 1942, and begin killing Germans. Such a pugnacious attitude that emphasizes the act of fighting to the exclusion of other factors may be ideal for a bar room brawl, but should it be the prime basis of military strategy? Such an attitude, it seems to me, tends to stultify the intelligent use of military force. It is not surprising, then, that the operational planners of the Anglo–American campaign did not give consideration to the obstacles of the hedgerows of the bocage in France, nor to the exploitation of initial successes against the Germans. The campaign in France became a brutal slugging match of slow gains and a contest between the Allied logistical buildup and the German logistical buildup.

It is fascinating to speculate about what World War II in Europe could have been like if the US Army had been capable of flexibility in military

thinking. An alternative to the Normandy invasion could have been the use of US logistical capacity and sea control for an audacious landing along the Baltic coast of East Prussia, only 90 miles from Berlin, followed by a drive into the German heartland. The psychological dislocation and chaos produced by the operation, as well as the disruption of Germany's ability to continue the war, would have been dramatic.

Joseph Forbes, *Pittsburgh, Pennsylvania*

MR BOOK REVIEWS

BALLISTIC MISSILES IN THE THIRD WORLD: Threat and Response by W. Seth Carus. 82 pages. Praeger Publishers, New York. 1990. $34.95 clothbound, $11.95 paperback.

It is an unfortunate irony that the spread of ballistic missiles in the Third World is accelerating at the same time the United States and the Soviet Union are destroying such weapons under the 1987 Intermediate-Range Nuclear Forces Treaty, and NATO and the Warsaw Pact are implementing unprecedented arms reductions under the recently concluded Conventional Armed Forces in Europe Treaty. Missile proliferation threatens regional and international security and the interests of the United States and its friends and allies. The ability of several new "missile powers" to mount chemical, biological and even nuclear warheads on such long-range delivery systems—which will soon include cruise missiles—has rightly made nonproliferation a top priority of US policy makers.

This brief, well-written, up-to-date monograph examines this problem in a way that will satisfy specialists and generalists alike. Dr. W. Seth Carus, currently a fellow at the Washington Institute for Near East Policy, is a highly regarded military analyst who has written extensively on the Middle East military balance and unconventional weapons proliferation. Edward Luttwak's foreword does credit both to the author's qualifications and the signal importance of his timely study of Third World missile proliferation.

Carus surveys the status of ballistic missile forces in more than 20 Third World states, where at least 15 missiles are operational and 13 are under development. In only 66 pages of text, he examines the motivations to acquire missile capabilities, the patterns of international transfers and indigenous development of missiles, the role of technology transfer and civilian space programs in furthering missile development, the military advantages and disadvantages of ballistic missiles, the variety of Third World military responses to ballistic missile threats, and finally, implications and options for US policy.

The author properly highlights the role of the US-inspired Missile Technology Control Regime (MTCR) in promoting international efforts to stem proliferation. However, he points out the regime's shortcomings and limited potential for slowing the spread of missiles in an insecure and fragmented world where proliferation is already far advanced and the diffusion of technology cannot be effectively controlled. Carus, therefore, recommends that the United States supplement the MTCR with enhanced intelligence capabilities to monitor missile developments and undertake regional and bilateral diplomatic and arms control initiatives to address the underlying causes of conflict.

The book concludes on a profoundly ambivalent note. The good news is Carus' modest optimism that ballistic missile proliferation can be restrained. The bad news is that he sees highly accurate and lethal cruise missiles spreading among Third World states in the 1990s, a potential threat for which he offers no analysis or solutions in this study. This subject deserves immediate attention by both analysts and policy makers. Carus conducted research on cruise missiles during 1989–1990 as an Olin Fellow at the Naval War College Foundation in Newport, Rhode Island, and we can look forward to the published results.

Ballistic Missiles in the Third World is a pioneering primer. It is the first monograph on the subject, joining extensive periodical literature and recent general works, such as *New Threats: Responding to the Proliferation of Nuclear, Chemical, and Delivery Capabilities in the Third World* by The Aspen Strategy Group and University Press of America and *Nuclear Ambitions* by Leonard S. Spector with Jacqueline R. Smith. It will doubtless remain useful even after the publication of more extensive studies of missile proliferation by Aaron Karp and Janne Nolan and Geoffrey Kemp's work on the spread of advanced weapons in the Middle East and South Asia, now in preparation or in press.

Joseph P. Smaldone, *US Arms Control and Disarmament Agency, Washington, DC*

DANGEROUS CAPABILITIES: Paul Nitze and the Cold War by David Callahan. 507 pages. HarperCollins, New York. 1990. $24.95.

Despite 50 years of high-level government service under seven presidents, Paul H. Nitze is not a name well known to the average American. Named vice president of a major Wall Street firm before the age of 30, a multimillionaire by 40, Nitze left the world of finance in 1940 for a post in Washington, DC. Over the next half-century, Nitze worked on the Strategic Bombing Survey, contributed in a major way to the Marshall Plan, became the primary author of National Security Council (NSC) 68, participated in the resolution of the Berlin and Cuban missile crises, negotiated the Limited Test Ban and Antiballistic Missile treaties, personally led the opposition to the Strategic Arms Limitation Talks (SALT) II Treaty and headed the US delegation to the intermediate-range nuclear forces talks in the 1980s. Along the way, he occupied high posts in both the departments of State and Defense, winning the special trust and confidence of US statesmen from Dean G. Acheson to Robert McNamara to George P. Shultz. Nitze was a man of enormous energy, intellect and dignity. Few men have had more influence on US defense policy in the post-war era.

In *Dangerous Capabilities*, his first book, author David Callahan chronicles the life and achievements of Nitze. Strengthened by abundant interviews and substantial archival research, Callahan has produced an enjoyable, readable book. As long as Callahan sticks to the life of Nitze, his effort is scholarly and worthy of respect. Unfortunately, Callahan also intended this book to be an analysis of US defense policy during the Cold War. Here, he loses his way. As he describes key events and decisions, Callahan constantly intrudes his own ill-argued, extreme viewpoints and judgments, especially in his treatment of US arms control ventures.

Callahan fervently believes that technological advances in weaponry can be denied through negotiations, even if no effective verification is possible. He advances the false premise that the United States could have prevented the development of thermonuclear weapons by negotiating a ban on their development with the Soviet Union in the early 1950s. He considers the Limited Test-Ban Treaty of 1963 to be a failure because US insistence on on-site inspections as a condition for banning underground testing prevented achievement of a full ban.

Callahan loses credibility by suggesting that a SALT I *verifiable* ban on multiple, independently targetable reentry vehicle testing and deployment could have been accomplished *without* on-site inspections. In his discussion of SALT II, he portrays Nitze as an irrational, hard-line ideologue, "a poisonous fellow." His arguments for and against SALT II do not even mention several factors crucial to the Senate's refusal to ratify the treaty: the resignation, in protest of Lieutenant General Edward Rowney, Joint Chiefs of Staff representative to the SALT talks, over the final product; the deployment by Leonid Brezhnev of SS-20s in Europe beginning in 1977; the refusal of the Soviets to limit their new Backfire bombers; and the Soviet invasion of Afghanistan, the event that caused President Jimmy Carter to withdraw the SALT II Treaty from consideration.

Not a Soviet expert, Callahan's footnotes rarely refer to significant works on Soviet defense policies. He portrays the Soviet Union as a misunderstood, if somewhat paranoid, giant—certainly no threat to the United States. Had the United States only followed more enlightened policies, the Soviets would have responded in kind. He fails to present the Soviet view of arms control negotiations. He is apparently unaware of recent publications by respected Soviet authors, which today acknowledge that the Soviet Union bears primary responsibility for the arms race and that it had been striving to achieve nuclear superiority over the United States and absolute security over all of its neighbors in the 1960s and 1970s. Callahan erroneously asserts that the Soviets stepped up missile production in the 1960s in response to US adoption of the strategy of flexible response, when Nikita Khrushchev's own memoirs state that he ordered the build-up as a result of Soviet humiliation during the Cuban missile crisis.

Callahan ends, first, by condemning the whole of Nitze's life in stating that through crusades for higher defense spending and vigilance against the Soviets, Nitze "had helped to delay a stable and lasting peace between the superpowers." Second, he attributes virtually all of the United States' social woes to high defense spending. He insinuates that, because of Nitze and others like him, the United States is fast becoming "a second-rate power polarized along class and racial lines." Nitze, according to Callahan, did not achieve victory in the Cold War. All he achieved was "a lost dream."

Do not look for cogent, scholarly, well-presented arguments about US Cold War policy or strategic issues in *Dangerous Capabilities*. My recommendation is to read it and enjoy it simply because Nitze is such an interesting, admirable character, but question Callahan's own thoughts.

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THE NEW NUCLEAR RULES: Strategy and Arms Control After INF and START by James L. George. 194 pages. St. Martin's Press, Inc., New York. 1990. $45.00.

The thesis of this concise but thought-provoking book is that "weapons and strategies formulated under the old non-restrictive arms control rules of the game are still being built even though the rules have changed." The assumed 50 percent cut in strategic forces that will emerge from Strategic Arms Reduction Talks (START) means that choices must be made between new nuclear systems. Combined with declining defense budgets, it may be impossible to maintain the traditional triad of intercontinental ballistic missiles (ICBMs), manned bombers and missile submarines, especially if there are to be multiple designs in each category.

James L. George, a senior fellow at the Hudson Institute, who served in President Ronald Reagan's US Arms Control and Disarmament Agency, believes that military strategy should take precedence over arms control when making hardware choices. He believes that it was a mistake to complete the Intermediate-Range Nuclear Forces (INF) Treaty before reductions had been made in Soviet conventional forces. He thus wants systems that can substitute for the banned land-based theater weapons. He favors the nuclear version of the Tomahawk sea-launched cruise missile that can be carried by a variety of US Navy warships and submarines. This weapon also has the advantage of being excluded from the overall START limits, though since this book was written, the administration has opened the door, under strong Soviet pressure, to its inclusion in the form of a separate statement.

George has a strong bias toward naval systems due to their inherent mobility. He argues that land-mobile systems like the SICBM and MX (small and advanced ICBMs) provide little real survivability because of a short warning time to set them into motion. The United States might still deploy the rail-garrison MX since the missile is already in production, but the SICBM should be cancelled since a second system with its development costs still ahead of it cannot be afforded. Cuts in systems to meet START ceilings should come at the expense of fixed silo ICBMs even to the point of complete elimination. The Poseidon D-5 warhead can provide the needed hard-target kill capability from submarines.

The B-1B strategic bomber might be useful, but the B-2 "Stealth" program should not go beyond the first few production models due to its high cost ($815 million, each). George thinks that the Navy's new A-12 Stealth attack bomber could be substituted for the B-2, as well as for the FB-111 in the US Air Force, especially if fitted with a new standoff missile with a range of 250 miles (under the INF 300-mile limit). Such a medium bomber (at about $84 million, each) could be built in larger numbers and would not be counted under START.

George's arguments also make sense in the wake of the Iraq crisis, which has focused attention back to limited war. Dual-purpose systems like cruise missiles and medium bombers could strengthen conventional, as well as nuclear, capabilities within a tight budget.

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ALLIES IN CRISIS: Meeting Global Challenges to Western Security by Elizabeth D. Sherwood. 245 pages. Yale University Press, New Haven, CT. 1990. $25.00.

With the official declaration of the end of the Cold War, it might appear that NATO and books dealing with NATO are passé. One apparent exception to this claim is *Allies in Crisis* by Elizabeth D. Sherwood. Rather than focusing on NATO issues proper, Sherwood explores the related issue of what support, if any, member nations can expect from other member nations in areas not formally covered by NATO treaty obligations. This concern, termed out-of-area cooperation, provides the central focus of this well-written, well-organized and historically informative book.

The approach used here is to look at a series of crises in which one or more principal NATO allies believed its important interests were being engaged outside the treaty area and where those things occurring had significant impact on alliance relationships. Specifically, Sherwood examines situations involving the possible use of nuclear weapons or portending a large-scale allied military commitment, such as the Korean War, the Suez War of 1956 and the French and US Indochina wars. These case studies are used as a prism through which the dynamics of alliance politics, beyond the official domain, are depicted.

One of the few shortcomings of this book is its concentration on the foreign and defense policies of the United States, the United Kingdom and France. In light of recent events in Europe, its failure to adequately examine the role of Germany in out-of-area matters is significant. While Sherwood rightfully claims that Germany's primary interests lay in Europe, recent cases like the industrial cooperation agreements with Japan, economic aid

programs to the Soviet Union and the exportation of chemical weapon technology to Libya indicate strong interests now exist elsewhere.

Nonetheless, it does appear out-of-area cooperation will become of greater import in the next few years for at least two reasons. First, while NATO's military mission may all but vanish, its political mission will not. Almost all member nations have agreed to this transformation and actively support it. Therefore, NATO will continue to serve as an informal means for out-of-area discussions. Second, in an era of reduced budgets and US commitment overseas, it is unlikely that any new alliance structures will arise. So, with no new formal means of cooperation, informal means, like out-of-area cooperation, will become more vital. As such, *Allies in Crisis* is an important reference for future researchers and practitioners.

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THE DREADFUL FURY: Advanced Military Technology and the Atlantic Alliance by Michael Moodie. 160 pages. 1989. Prager Publishers, New York. $34.95 clothbound. $10.95 paperback.

As debates rage on whether the Cold War is really over, it might be well to remember that for the Soviets, conflict need not always be military and that Carl von Clausewitz's too often heard dictum on the nature of war and politics is actually a two-way street. With this in mind, Michael Moodie's book provides a refreshing and timely look at three issues whose significance has increased because of the recent trend in East-West relations: advanced military technology and its effect on the nature of war; transfers of this technology between West and East; and the alliance politics that unite these two.

Moodie's credentials and background add substantially to this work. A senior fellow at the Center for Strategic and International Studies (CSIS), he spent four years as special assistant to the ambassador at the US mission to NATO and has written widely on security and alliance issues. *Dreadful Fury*, produced as a Washington Paper for CSIS, begins with a review of the ways that changing technologies affect the international environment and ends with a convincing argument for a "NATO Technology Management Strategy." Along the way, Moodie examines the impact that technology will have on the future battlefield, the need to protect those technologies developed in the West and prevent their dissemination, and to achieve this, the need for better cooperation among the members of the alliance.

While many of these topics may seem to have been raised before, what makes this work especially appropriate is the setting the West finds itself in today. With calls for reduced defense spending to match the perception of a reduced threat, the allies can ill-afford the duplication of effort that, in the past, wasted research and development assets or allow the technological advantage they possess to slip away. Cases where this has occurred in the past are all too common. However, while errors have been made in the past, the alliance can avoid such mistakes in the future by evaluating what is involved and establishing a unified position. "If the United States and its allies are to implement fully the opportunities new technology creates, they must first decide the ways in which they can be most useful."

Overall, the work is both timely and thought provoking. At a time when the alliance is strained by the desire of its members to determine individually the response of each to the rapidly changing world we face, Moodie argues convincingly for the need to unite rather than fragment, for the advantages of cooperation as opposed to disunity. Finally, he reminds us that while change abounds, some things remain the same. "New technology is not changing the nature of war, but, in several important ways, it is altering the battlefield on which war will be waged." In this regard, the entire book helps define an issue that will alter the nature of the battlefield of the future.

MAJ Daniel L. Burghart, *USA*, *US Military Academy, West Point, New York*

THE NEW EASTERN EUROPE: Western Responses by J. M. C. Rollo with Judy Batt, Brigitte Granville and Neil Malcolm. 137 pages. The Council on Foreign Relations Press, New York. 1990. $14.95.

This book analyzes the important changes occurring in Eastern Europe (particularly in Czechoslovakia, Hungary, Poland and the German Democratic Republic) after the collapse of prior governments and suggests policies those countries might institute that would best serve the interests of both East and West. The authors first discuss the impossibility of economic reform under Leninist systems. They contend that politics must change before economics can improve, since the previously socialist systems cannot effectively straddle the line between Western "welfare capitalism" and communism, as past attempts to do so demonstrated.

The authors next list elements essential for reform, including systems allowing effective commercial and civil law, open pricing, fair competition, democratic authority over public-sector activity and citizens' right to own property. Reform priori-

ties that will stabilize and assist in changing existing structures, in their view, include developing markets for capital in order to encourage savings and investment, opening markets to attract competition from major foreign goods producers and writing new/reforming legislation to permit bankruptcy, investing abroad and private property. An entire chapter is devoted to the special case of the Soviet Union's new role and problems peculiar to that beleaguered state.

The final three chapters are devoted to possible avenues of approach for Western policy makers dealing with Eastern Europe. In the authors' view, key issues will certainly include energizing the private sector by the daunting task of integrating the area's economies with all other market economies. Achieving this activation may require debt relief (a problematical matter, both because of the magnitude of debt and the possible ramifications in other debtor nations).

This information-packed book discusses serious problems that require immediate attention, but it sheds little new insight on the subject. It would prove most helpful to those looking for a condensation of current East-West economic and political issues, rather than for possible long-term answers.

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THE CUCKOO'S EGG: Inside the World of Computer Espionage by Clifford Stoll. 326 pages. Doubleday & Co., Inc., New York. 1989. $19.95.

Dr. Clifford Stoll, an energetic, free-thinking and perceptive young man who worked at Lawrence Berkeley Laboratory (LBL) a few years ago, claims to be an astronomer by training and a computer security expert by accident. The first week in his new job at the LBL computer center, his boss presented him with a challenge: find a 75 cent accounting error in a system that tracked thousands of dollars each month.

Stoll says that, from an astronomy perspective, 75 cents was an interesting number. An error of hundreds or even thousands of dollars would be no big deal; probably a simple mistake and easily corrected. Errors in the pennies column often arise from a deeply-rooted problem.

The problem was deeper than anyone expected. Stoll found that an unknown computer user caused the 75 cent error. Further investigation of the user showed he was an intruder who had invaded the LBL system and dozens of other computers around the country. What began as a short-term task to find a few missing pennies turned into a year-long hunt for a computer spy.

The spy "hacked" his way into a variety of computer systems. Many of the systems were operated by colleges and universities and contained valuable medical and scientific research data. Other computers belonged to private companies, some of whom were working on government defense contracts. Still others belonged to the government, particularly the Department of Defense (DOD).

With LBL's permission, Stoll remained open to the hacker while recording and tracing every action. In most cases, the owners of computers—including many military systems—attacked by the hacker were unaware of the intruder until Stoll alerted them. Despite DOD's years of experience with computer security, the hacker spy was still able to penetrate a number of extremely sensitive DOD computers. These included several supposedly secure systems.

The data the intruder browsed and stole was nothing short of mind-boggling. Although none of these systems processed classified information, there was a wealth of sensitive unclassified data. Much of that data could be combined with other information to produce a result that could well be classified in sum. Stoll suffered a year of headaches, a disrupted personal life and almost unbelievably frustrating encounters with the federal bureaucracy. Finally, the hacker spy was arrested in West Germany. He was selling the stolen US defense data to the Soviet Union.

There are a number of lessons we can learn from *The Cuckoo's Egg*. In truth, we *must* learn them if the US Army is to ensure its capability to meet mission requirements in an increasingly technical and information-based environment. One of the most important lessons from this book is that, despite all the "gee whiz" technology, information systems security is not primarily a technical problem. It is a people problem and a management problem. Commanders and managers must actively promote computer security practices and integrate them into mission objectives. Technical specialists must be sensitive to security concerns, not just system efficiency. Computer users must participate in security efforts and help protect their own valuable work.

This story of computer espionage grabs and holds the reader's interest. Despite the technical subject, the reader need not be a computer specialist to understand and appreciate the story. I strongly recommend the book to everyone who uses or manages computer systems in their operations.

Harlan W. Crouse, ***Directorate of Plans, Training Mobilization, and Security, Fort Leavenworth, Kansas***

USO

50 Years of Service

February 1991 marks the 50th anniversary of the United Service Organizations or USO, as it has come to be known by millions of servicemen and women and their families since its inception during World War II. Best known for its camp shows during our periods of war, featuring such stars as Bob Hope, Bing Crosby, Martha Raye, Marilyn Monroe, and more recently, Lee Greenwood, Steve Martin and Jay Leno, the USO has also provided recreation and assistance through hundreds of clubs and centers around the globe. Today, the USO operates 150 centers, 82 in countries overseas, with some 20,000 volunteers assisting a worldwide staff of 750. After 50 years of service, the USO once again has gone to war, providing live shows, movie premieres, social services, communications with families and many other services to those US men and women serving our nation in the Persian Gulf.

Military Review

WRITING CONTEST

Through the generosity and continued support of the Command and General Staff Officers Course Class of 1985, **Military Review** announces its annual writing contest.

Entries on the topic, "The Army in American Society," will be accepted through 15 July 1991. The author of the winning manuscript will receive a $500 cash award and the manuscript will be published in **Military Review** in the fall of this year. The award for second place is $200 and for third place, $100. **All** entries will be considered for publication in **Military Review**.

The topic area is large and covers a broad range of issues having impact upon the American public as a whole. Included are such subjects as: values, ethics and morality, women in combat, public support for the military, the Volunteer Army, Selective Service, citizen-soldiers in the Total Force, AIDS, the military-media relationship, equal opportunity, the Army's role in drug interdiction and alcohol and drug abuse.

Manuscripts must be original and not previously offered elsewhere for publication. They should be between 2,000 and 3,000 words and typed double-spaced. A writer's guide appeared in our January 1991 issue and is available upon request. Please clearly indicate that your manuscript is for the writing contest.

Send entries to Military Review, US Army Command and General Staff College, Funston Hall, Fort Leavenworth, KS 66027-6910.

☆ U.S. Government Printing Office: 1991—554-081/20018